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1914-1918

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THE YEARS OF THE WAR BIRDS

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THE YEARS OF THE WAR BIRDS

Arch Whitehouse

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1960

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DEDICATED TO *My Fellow Quiet Birdmen Everywhere*

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FOREWORD

THE WAR of 1939-45 was the first real air war.

Although aerial combat was born and primarily developed during the Great War of 1914-18, the science was too new to have had any significant effect. It is true that men carried out aerial reconnaissance from moving aircraft, fought dramatic duels in the air from light-weight scouting planes, and flew on tactical and strategic bombing raids. All these airborne military operations took place, but they had little influence on the eventual outcome. From a tactical point of view aviation had not been fully exploited. World War I can best be credited with the basic development of the military aircraft, rather than the provision of an arm that struck the deciding blow.

The great difference between the air history of the two World Wars was that the 1914-18 conflict was the fighter pilot's show. It presented the glorious drama of the air aces, and only their scores and personal exploits are remembered.

The first aerial blow struck in World War II was a bombing raid on Poland. Our most poignant memories are of the bombing of Britain, the thousand-plane raids on Berlin, the blockbusters, the argument concerning the value of day or night bombing, the secret bombsights, and Hitler's pilotless bombs that were released too late to influence the outcome.

Saturation bombing destroyed much of Germany's war potential; U.S. precision bombing cut her gasoline supply to a mere trickle; naval bombing attacks blasted most of the pocket battleships from the high seas; and tactical bombing of the highest order assured the first foothold on Fortress Europe.

Jimmy Doolittle's token raid on Tokyo annealed the basic truth that the Japanese Empire could not withstand a full-scale attack. History records that Hirohito was eventually convinced that his cause was hopeless when the atomic bombs fell on Hiroshima and Nagasaki.

This book will not play down, nor ignore the role of the fighter squadrons. They all performed important, but varied, roles that maintained the great tradition, but they were not fighting the same war that originated air combat in 1914-18. Single-seater pilots of 1939-45 were restrained by new rules and different combat requirements. There were few lone-wolf characters, and only a handful of outstanding aces; there was no place for the hero whose chief aim was to run up a score, regardless of the tactical value of the target.

The fighter pilot of World War II was a new type. Ramrod discipline restrained any personal exhibitionism. He was trained in precision-element teamwork. He was never free from base control, since radio communication was diligently maintained. His combats were not adventuresome jousts a few miles from his base. Tip tanks and belly tanks provided fuel that took him hundreds of miles into enemy territory. There were no old-time happy-go-lucky exchanges with his opposite numbers that could be broken off on whim or discretion.

His duties were laid out to be performed like clockwork. His personality had little to do with his score. When he returned from his patrol, whether it was bomber escort, area defense, or an offensive mission in search of enemy aircraft, he had to account for every minute of his time, every round of ammunition expended, and a wing camera usually caught him in any infraction of fighting maneuvers. Every thought, move, gesture, and radio report had to be accounted for to the interrogation officer. This was a heartless, but highly important, examination of every fighter pilot who was lucky enough to return from his mission.

There were fighter-pilot missions for a hundred military requirements, and these missions changed with the scenery, the weather, the years of the conflict. What made a great fighter pilot over London during the Battle of Britain, might be of negligible value when General Rommel was at the height of his career in the North African desert. Escorting Flying Fortresses over Hamburg was nothing like

naval fighter-escort duty that began with a wild flutter from an aircraft-carrier deck in the Pacific. Low-level fighter attack against enemy transport and railroad locomotives was totally different from night fighting, under radar guidance, against enemy bombers. Intrusion tactics along the European coastline in which the fighter assumed the temporary duty of the low-altitude bomber, presented problems wholly unlike those encountered by the poor devils who drew Cam-ship Hurricane assignments and were snapped off catapults to protect North Atlantic convoys.

There was a most varied pattern of aerial action in World War II. The several categories of light and heavy bombers were each designed for a particular mission. What fitted army requirements was of no practical value in naval operations. The desert and jungle created hundreds of new mechanical and tactical problems. The Arctic conditions on the Murmansk run, in front of Stalingrad, and along the frigid necklace of Dutch Harbor demanded aircraft, armament, and flying equipment that taxed the resources of scientists the world over. The air crews who fought the German U-boat menace were reminiscent of the best in navy tradition, and their tenacity matched the heroism and devotion to duty of any fighter or bomber pilot.

There were many kinds of heroism. Nationality, stature, personality have nothing to do with courage. During 1944 I talked with a young American pilot whose job was to fly alone to Berlin once every day. He carried no guns or bombs. He flew there early every morning, evading enemy flak and fighters, simply to find out what the weather was over central Germany. He did not consider his chore particularly hazardous. Instead he seemed to enjoy it. The rest of the day was free, he explained offhandedly.

I met several flight medical officers who regularly flew on long-range missions solely to test a new item of food, clothing, an oxygen mask, or a portable food-heating system. When I suggested that the same tests could be carried out in comparative safety at the same altitude over the same length of time over their own field, they argued: "Not so. Nothing happens over your own field. We want to know what takes place over Stettin, Berlin, Schweinfurt, or Hamburg."

In other words, no one shoots at you over your own field.

I also learned that the heroes of World War II bore little resemblance to their fathers who flew in the Great War. Although a large portion of the action was fought over the same geographical area for the same political considerations, the airmen of 1939-1945 had little in common with the fliers of 1914-18.

As a war correspondent with a service background of World War I, I was something of an enigma to most of them. Official Washington had suggested that I wear my World War I wings and decorations "to gain the confidence of the men you will associate with." This display was a definite advantage at times, but more often it involved me in experiences that were, to say the least, somewhat hair-raising. Because I had flown in one war, many air crews invited me to accompany them on what they promised would be interesting "milk run" missions, but which usually turned out to be most hazardous and frightening.

In these reportorial forays that began with the Royal Canadian Air Force before America entered the war, I soon realized that this campaign would offer a new concept of aerial combat. Most of the equipment baffled me, and I was lost in the maze of structure and detail found aboard the 1939-45 bombers. The 1940 fighter weighed more than three tons, whereas my 1918 Sopwith Camel, fully loaded, went to only 1959 pounds. I had been perfectly satisfied with two rifle-caliber machine guns, but even early in this war the fighters carried eight machine guns, and some were equipped with an air cannon that hurled hellish bursts of 20-mm slugs.

Open cockpits were passé long before 1939. Plates of armor protected pilots and important mechanisms. The old simple tube Aldis sight had been replaced by a very complicated device which quickly gave the pilot a wealth of information concerning his target and its relationship to his gun muzzles. These aircraft flew at tremendous heights and the pilots and air crews had to be furnished with oxygen masks and special heater systems to keep them efficient or alive at such altitudes. Giant bombs were carried in enclosed bays and released by a complicated system of solenoid switches. No longer did a gunner or observer pull the toggles to release the bombs; a specialized performer called a bombardier was included in the crew for that particular job. The distances covered demanded skilled navigators, and some multiengined airplanes were so complicated that

they required flight engineers to handle the maze of switches, toggles, dials, pressures, and gauges.

I spent considerable time with the Royal Canadian Air Force, the U. S. Navy, the U. S. Eighth and Ninth Air Forces in the European Theater and was familiar with most types of aircraft flown by the Allies and made many friends among the personnel. It was a valuable experience and numerous stories and articles came from my typewriter, but when it was all over I realized how great was the spread of advance between the wartime flying of 1914-18 and that of the Second World War.

I have tried to present a comprehensive picture of those days, using the colorful pattern of people and events to carry the record. I have not attempted to reproduce the logbook of every pilot, or the history of every squadron. Air attacks, raids, and personal adventures which symbolize the story, have been used with profusion, but with each chapter I wondered whether anything like this could happen again.

Will there be another air war? Will men again fly fighters and bombers in global conflict? Will World War III open with the brush-fire activity of the Tactical Air Command, or will it all happen with such immediate impact that not even the Strategic Air Command will get off the ground?

Guided missiles, atomic warheads, and nuclear surface and submarine forces appear to have outmoded the manned military aircraft. When on a recent visit to an atomic submarine I was told that within a short time they would be using something called a Subroc, "the torpedo with a Ph.D.," which will be fired from a regular torpedo tube, swim to the surface, take off into the air as a missile, soar from forty to fifty miles to a point above its target—perhaps an enemy sub—plunge back into the sea, listen for its prey on its own sonar, latch on and close in and finally destroy the target with its thermonuclear warhead, I came to the conclusion that I had seen the last man-fought war in the air. I also decided that what I had experienced in 1914-18 was about as rewarding as one might expect in military conflict. For this reason, then, it might be well to reconsider what glory we experienced in World War II and read over history that will never be repeated.

THE YEARS OF THE WAR BIRDS

[1939]

ON THE EVENING of May 16-17, 1943, an event occurred which best illustrates the air action of World War II. In particular, it accents the air-crew training necessary for precise attacks, the development of special equipment, and, equally important, the design of certain weapons for specific targets. The operation, which was designed to destroy two important dams that supplied water for the industrial Ruhr, was in preparation in the mind of a civilian for almost four years. The unusual, and fateful, mission was little publicized at the time, and has not been fully appreciated since.

Probably no air operation was carried out with more secrecy and eventual success than the Royal Air Force's "earthquake bomb" attack on what came to be known as the Ruhr dams. The result was that the Moehne and Eder lakes were emptied and 330,000,000 tons of water torrented through the western Ruhr Valley. Fifty miles from the breached dams, coal mines were flooded and munitions factories collapsed, an important military airfield at Fritzlar was inundated, hundreds of roads, railroads, and bridges disappeared, one complete industrial suburb forty miles from the Eder was entirely under water, canal banks were washed away, power stations vanished and the Ruhr foundries were without power or water for making steel. The initial effect was that the production of 100,000 men was lost for several months.

Barnes Wallis was fifty-two years old when he first considered the importance of enemy water power. The day before the war broke out he was enjoying a seashore vacation with his family on a quiet

bay where they had pitched two small tents for their shelter. The play of his children building sand castles which were toppled by the surge of the incoming tide gave him his first idea. The sand castles reminded him of hydroelectric dams. The water always gnawed away the base and the little battlements tumbled down, time after time. The greatest damage was done when the surf hacked at their foundations. Dams . . . hydroelectric power . . . definite destruction at the base. If a bomb, or some explosive, could be placed at the foundation of a great dam . . . some vague theory about shock waves. . . .

Barnes Wallis recalled seeing concrete piles being driven into the bed of the Thames River to support a bridge. The piles kept shattering mysteriously, and on investigation it was discovered that when the great drop hammers pounded the piles into the river bed, the piles had exploded upward.

Shock waves! The sudden blows had sent shock waves down the piles and at the bottom they had met the resistance of the bed clay and had bounced back up the piles at 15,000 feet per second and reached the top just as the hammer had bounced off. There was nothing to rebound from and they passed out and escaped. In their wake came a tension after compression, a high-speed reaction that shattered the piling.

Barnes Wallis wondered if he could put shock waves at the bottom of a hydroelectric concrete dam—if he could lock the explosion underground so that it could not break out, he might set up an earthquake. All he needed was an earthquake bomb—one that would explode from below. He knew he could not put a bomb inside a concrete dam, but since the dam was set in water, it might transmit sufficient shock wave that would accentuate the explosion. It certainly would be better than just a pad of thin air.

Wallis was an aviation engineer who had designed the Vickers Wellesley which had captured the world's nonstop record. But prior to 1939 bombers weren't of particular interest. All concern in Britain had been in fighters. At present he was working on another model known as the Warwick, but he felt that the missiles had not kept pace with the aircraft built to deliver them.

Unquestionably, both bombers and bombs had reached something of a stalemate. In August of 1939 the R.A.F. was still dropping 500-pounders, a type left over from World War I, and while they made

a lot of noise and looked impressive when a small mechanic was photographed beside one, they didn't do too much damage. However, there was some hushed talk that a 1000-pound bomb was being considered.

Barnes Wallis wondered what type of target would harm the enemy most. He knew that (on paper) all important munitions factories were being dispersed, both in Germany and Britain, but he realized that although both countries could move and hide their factories, there was little they could do about the chief source of energy. These plants were too big, or involved, to move or hide; the dams which harnessed the waters, that turned the turbines, that made the electricity for the hydroelectric plants were massive structures. No 500-pounder would even deface their sleek angled surfaces. It would require a tremendous bomb, combined with harnessed shock waves, to break up the ramparts of ferroconcrete which were anchored deep in the earth.

Alone, and without official encouragement, Barnes Wallis studied all types of bombs, their explosives, and their behavior under certain conditions. The more he considered the problem, the more certain he was that bomb raids against power dams were the answer to successful assault against Germany's war production.

On the war maps three German dams stood out above all the others—the Moehne, the Eder, and the Sorpe. All were in the Ruhr and produced practically all the water supply for that Nazi arsenal. It took eight tons of water to make one ton of steel.

The Moehne dam which harnessed the water of Moehne lake was 112 feet wide at the base, towered 130 feet high and was topped by a concrete roadway 25 feet wide. The Eder dam was even larger and a 500-pound bomb would hardly mar its classic surface. What was needed was something that would create an earthquake effect—get down under the actual base of the dam, blast it into a great hump, which in turn would tear the great wall apart. It could not be shattered by direct hits with large bombs—too much of the explosive effect would be wasted.

After weeks of calculation, Wallis decided that a 10-ton bomb carrying seven tons of explosive would do the job. So far, there was only talk of 1000-pound bombs, and there was no bomber aircraft anywhere in the world that would carry a 20,000-pound missile.

During the terrible period of Dunkirk, Wallis presented his idea to the Ministry of Aircraft Production, and a few important people in the R.A.F. were shown the plans—a better time for a new weapon could not have been conceived. But Wallis's suggestion for a new Victory bomber and an earthquake bomb were received with lukewarm interest, incomprehension, or official derision. Only Air Marshal Arthur W. Tedder sensed what Wallis was trying to do, but he felt that the man was reaching for the moon. He asked Wallis to devote some time to the development of pressurized aircraft cabins for high-altitude work—it seemed that such an idea had been broached in the United States.

Wallis said he knew about pressurized cabins since Vickers had been experimenting with them for months. Failing to convince Tedder, he went next to Lord Beaverbrook who was in charge of Aircraft Production, but Beaverbrook had been persuaded that four 250-pound bombs dropped "in a stick" were more potent than a 1000-pounder. Anyone who thought in terms of a 20,000-pounder was wasting the bureau's time.

Wallis went back to Vickers and eventually wrote a treatise on his 20,000-pound bomb and what it could do if dropped in the right places. He had seventy or eighty copies made up and mailed to important people. A few days later the Secret Service sent a man to check on Mr. Wallis's credentials, patriotism, sanity, and real intent. When it was learned that about seventy of these booklets had been distributed, the Secret Service were very upset, and asked him not to do it again.

But one of the seventy booklets finally found a champion and an Air Attack on Dams Committee was formed, and Wallis was instructed to carry out several preliminary experiments. A new explosive listed as RDX was available now, but after several actual tests against model dams, even Wallis was convinced that it might take 30,000 pounds of the new explosive carried in a special case, which itself would weigh another 40,000 pounds. This meant that a bomb capable of breaching the Ruhr dams would weigh more than thirty tons! There was no plane available that could carry such a load.

There had to be a new way, a new answer. Wallis finally evolved a bomb of new shape and design which, on being delivered from a low altitude, would flatten itself against the base of the dam wall

and explode there. The cushioning effect of the water would increase the explosive force of the RDX, and a number of them, all delivered in the same manner, eventually would breach the dam. The bomb would be seven feet in girth and of unstated length.

It took months of design, redesign, trial, error, and eventual proof on film that such a bomb could be made, delivered, and exploded with the required effect. This one would weigh only 9000 pounds, and could be carried any reasonable distance by the new four-engined Lancaster bombers now coming off the British production lines.

On February 26, 1943, Wallis finally was told to go ahead with his project and prepare for an operation no later than May. That gave him about three months.

It is uncanny how two laymen's minds often work along the same path. On the same day that Wallis returned from his seashore vacation to begin study on his earthquake bomb, back in the summer of 1939, a German *Oberbürgermeister* by the name of Dillgardt, had written to military chiefs in Muenster that something should be done in the defense of important dams, such as the Moehne and Eder. Dillgardt feared that an aircraft bomb, exploded deep in the water some twenty meters from the dam, might blow a large hole in it. He painted an unhappy picture of what might happen, if such an attack was ever made. He was assured that the matter would receive careful and immediate attention.

Over the next three years the correspondence between Dillgardt and Muenster filled a large file. Dillgardt even predicted that the attack would be made in May, when the dams were full, and at intervals the military posted some flak guns and searchlights on them to appease the man, but they were always removed later on some pretext. Once, he was allowed to have a few 20-mm guns and told to stop reporting on the storage level of the dams.

On the night of March 15, a four-engined Lancaster bomber was headed toward Stuttgart with an 8000-pound blockbuster in its bomb bay. Halfway to the target an engine faltered and the young pilot at the controls pondered on whether to turn back or drop down to a lower operating altitude.

Under the circumstances, it was a difficult decision to make since

this was Wing Commander Guy P. Gibson's one hundred and seventy-third trip—the last of his third tour of duty. If he dumped the bomb into the sea and played it safe, he would have to go again to fill out the operational tour. He and his crew were due for a long leave and rest, so Gibson decided to nurse the ailing engine and make an effort to get to the target.

They reached Stuttgart on three engines, dropped the blockbuster where it belonged and nosed down for the night shadows and hugged enemy territory all the way back to safety.

Wing Commander Gibson was twenty-five years old and had already won the D.S.O. and the D.F.C. For that evening's work he was told he had been awarded a bar to the D.S.O. and advised that his group commander wanted a word with him.

Air Vice Marshal Ralph A. Cochrane half-remembered a man named Wallis when they were both in the old Royal Naval Air Service during the First World War. Cochrane had been a dirigible pilot and Wallis had devised the world's first airship mooring mast. The night before the Stuttgart show Cochrane had been told of Wallis's new bomb and his idea of destroying the Ruhr dams.

"If Wallis says it can be done, it can be done," Cochrane reflected, "but I certainly would want a good squadron and a top-hole man to lead the show."

Guy Gibson was the young man they all thought of at once. Air Vice Marshal Cochrane sent for him and their conversation went something like this:

"Good morning, Gibson. Let me congratulate you on your bar to the D.S.O."

"Thank you, sir."

"How would you like to do one more trip?"

Gibson admitted afterward that he felt imposed on but he asked, "What sort of a trip, sir?"

"I can't tell you, except that it is most important and I want you to command the operation."

Thinking he was in for another dose of flak and fighters, Gibson simply said, "All right, I think I can make it."

As Cochrane talked all around the subject, explaining it was a dangerous but important mission, Gibson conjured up ideas of another attempt to get the German 45,000-ton battleship, *Tirpitz*, hid-

ing in a Norwegian fiord, where it was a serious menace to Russian convoys, and a target few men wanted any part of.

In a second interview Cochrane explained that a period of special training was in order. "It's all low flying. You've got to be able to low-fly at night without thinking about it. Real low down."

Now Gibson was certain it was the *Tirpitz*.

"A new aircraft will be ready in a couple of days, and in the meantime you had better get busy and pick a new squadron of air crews. You will be based at Scampton, and the new Lancasters will be delivered as fast as they come off the assembly line."

The R.A.F. personnel officer quickly provided twenty-one crews, a special ground staff, spare parts, and general equipment, all of which turned up at Scampton within forty-eight hours. "Dinghy" Young, a Californian who had been shot down twice in the Channel, and Joe McCarthy of Brooklyn, who had joined the R.A.F. early in the war, were among Gibson's flight commanders. At the first opportunity Gibson called his air crews together and attempted to explain why they were there: "You're a special crack squadron to do a special job. Don't ask me what it is, because I don't know. All I do know is that we shall be practicing low flying until we can do it with our eyes shut."

Someone mumbled, "*Tirpitz!*"

"Don't jump to conclusions. It might and it might not be the *Tirpitz*. Discipline and security are most essential. You've got to keep your mouths shut. This time your lives really depend on it. If we can do a surprise job, we may come home. If not. . . ."

That night they learned that they had been allotted a new unit number and they drank pints of beer to Number 617 Squadron.

A short time later—after some low-flying training had begun—Gibson was introduced to Barnes Wallis, who simply explained, "There are certain objects in Germany which are very big and quite vital to their war effort. They're so big that ordinary bombs won't hurt them, but I have an idea for a special type of big bomb."

Gibson looked baffled.

The Vickers engineer showed him motion pictures which explained some of the shock-wave theory. "The idea is to put this bomb in the right place. You'll be flying over water at night or in the early morning when there might be a streak or two of fog. The

approach must be made at a speed of 240 miles per hour, 60 feet above the smooth water, and the bomb must be put in accurately."

Gibson argued: "But it is very hard to judge your height over smooth water. Is there any margin of error?"

"Absolutely none. It has to be 60 feet, no more, no less. The bomb must be put in accurately, or we lose all the shock-wave effect."

Gibson could only admit that they could try.

Few of the men at Scampton believed such accuracy could be carried out. They tried every trick they knew over the waters of a lake to the north; ten different routes were laid out for the crews to fly over, but they still had no inkling of what they were practicing for. They all could fly level over lake surfaces with their altimeter needles flicking around the 60-foot mark, but they knew that over Germany—if that was where they were going—the barometric pressures would be unpredictable. When Gibson tried it during dusk with fog drifting out over the lake, he found he had difficulty judging height, and none of his crew liked any part of the task.

In the meantime small models of the targets were shown only to the flight commanders, and for the first time they knew it was not the *Tirpitz*, but it took some minutes to realize they were dams and Gibson sensed that this was no ordinary "unusual" job. He ruminated to himself, "If we overshoot and the bomb hits the parapet, nothing will happen to the dam . . . but what will happen to the bomber, leapfrogging at 60 feet!"

Transparent amber-colored screens were fitted inside the cockpits and the pilots wore dark blue glasses; thus flying by day was exactly like flying in the moonlight. They flew thousands of miles, first at 150 feet, and gradually developed some basic skill. Then a new problem arose. The bombsights they were using were useless for a precision task of this sort, so an R.A.F. bomb expert contrived a sight made from odd pieces of three-ply, wire nails, and a simple, bored sighting hole. It was based on the theory of triangulation by using the two towers of the main dam walls, which were a known distance apart. The sight was a fantastic piece of simplicity and when it was tried out with dummy towers across the neck of a Midland lake, the results were astonishingly good.

Everything was working out. They had the aircraft, crews, the

bomb, and a suitable sight, but still they were not satisfied with their efforts to maintain a height of 60 feet. Wallis kept experimenting with the bomb casing to make sure it would not break on impact with the water. Test shots were tried over and over, and it was obvious success would result only if the bomb were delivered from the proper height.

A Ministry of Aircraft Production official had a golden idea. "Put a spotlight under the nose and another one under the belly, both pointing down and inward so that they converge at 60 feet. When the two spots come together on the water—there you are."

All the pilots of the new squadron tried this trick while flying back and forth across their field—it worked splendidly. A navigator located above an observation blister looked down and simply said, "Down . . . down . . . down . . . steady . . . okay." Next it was tried out over Derwent Water and they discovered they could fly within two feet of the desired height with consistency.

Meanwhile, a complete squadron of Lancasters was redesigned to take Wallis's new, much-strengthened bomb—and rather freakish machines they turned out to be. The bomb doors had been removed, the mid-upper turret taken out, and much of the armor plate dispensed with. A lot of electronic equipment protruded everywhere underneath the machine and it looked more like a great insect than a military aircraft. However, it flew, and final tests against a simulated dam worked out beautifully, and by May 15 it was decided that Gibson could make his attack at any time, but unfortunately the latest photos taken over the German dams disclosed that some strange activity was being carried out there. After interpretive experts had studied them for some time, the best conclusion they could form was that the enemy had decided to mount new gun positions, which meant there had been a security leak. (Actually, they were a set of decorative evergreen trees, but this was not known until after the war.)

On the evening of May 15, Gibson explained to all crews exactly what they had been training for.

"We have a chance to do more damage to the Hun than any other squadron in all history. We believe there is only light flak in the area and no balloons protecting the dams. They have a few nets, but they will not withstand the bombs you will carry."

He opened up the models of the dams and ordered all members of the air crews to examine them.

"I want you to look at these models until your eyes pop out. After that, go back to your quarters and draw the layouts from memory, then come back and see what mistakes you have made, and go back and draw them again. Do that all night, if necessary, until you have them perfect."

About 4 P.M. the next day all crews were briefed again and the squadron broken up into three groups. Number 1, known as "Cooler" formation, was to attack the Moehne, the second was assigned to the Eder, and a small formation of five machines was given the Sorpe target.

At 9:10 that evening a red Very light signal hissed out from Gibson's lead machine, and McCarthy, the pilot from Brooklyn, led his Eder formation away; they had farther to go so were given the earlier start. Ten minutes later Guy Gibson flew his G for George off, followed by his other two formations. The great raid was on.

The Moehne dam looked like a tremendous concrete battleship—one hundred feet wide of reinforced concrete.

Someone muttered into an intercom: "My god! Nothing can break that!"

As they maneuvered for the run-in, the dull monster below came to life and sharp flashes spat angry comets into the leaden sky. The pilots swung their aircraft away and circled, keeping out of range. Gradually, Gibson had the bombers where he wanted them. One of his ships had been shot down an hour before, but when he was ready, he called his formation, "Hello, all Cooler aircraft. I am starting the attack. Stand by to move in on order when I tell you."

"Okay, Leader. Best of luck," they responded.

Gibson turned wide and hugged the cover of the wooded hills at the eastern end of the lake and three miles ahead, put the Lancaster's nose down and roared for the ramps and towers of the dam. The navigator said, "This is wizard. I can see everything."

Someone else switched on the spotlights and the navigator droned, "Down . . . down . . . up a trifle . . . steady . . . steady."

G for George was on target. Gibson held her steady and pointed for a spot between the towers. Pullford held the throttles, with his

eyes on the air-speed indicators. Spafford had the plywood bomb-sight, and the towers were closing in on the nails. The dam rushed at them like a savage giant, and the gunners slammed burst after burst at the enemy redoubts. The cabin stank with cordite and no one noticed the slight leap as the big bomb went out. Spafford had to yell, "Bomb gone!" before Gibson realized he had to zoom to leap over the great wall of concrete. Someone fired a Very light to let the others know the first bomb had gone in.

Everybody was yelling and there was wild confusion. A gunner plastered something else that annoyed him—finally the big bomb went off. They were clear and into the black shadows beyond and heading for the hills before the water between the towers suddenly rose and split apart. Those who could see said something white erupted through the middle of everything and climbed toward the sky. By the time the white something reached its peak, the lake was writhing and they heard the explosion. The great tower of water fell across the dam, and the white something faded out like the outline of a fantastic ghost.

Gibson circled for position and ordered the next Lancaster to move in. They watched the plane flown by pilot Hopgood head down the lake. They saw its lights flick on and the two yellow pools slide across the sable surface until enemy flak caught it and set it afire.

Gibson gasped. "He's been hit!"

The Lancaster marked "M" had a blinding glow around the inner port engine. A long ribbon of flame unfurled and the bomb aimer did not release the missile until too late; it went over the parapet and fell on the powerhouse below. M for Mother went past the dam and struggled to get her nose up so that the crew could bail out, but a tank blew up, a wing ripped away, and the bomber spun into the ground.

"Okay . . . P for Popsie," Gibson called. "Are you ready?"

"Ready, Leader."

"Good. I'll fly across the dam as you make your run and try to draw the flak off you."

Popsie put her bomb in where it was intended and as the missile went out two shells smacked into a starboard wing and one of them exploded in the inner gas tank but the tank was empty and fortunately nothing happened.

A for Apple went in next, for nothing serious seemed to have taken place at the big redoubt below. The bombs appeared to be blasting water skyward and sweeping it over the top, but the big barrier was still intact.

Dinghy Young from California who was flying A for Apple reported, "Making bombing run, Leader."

Gibson swung back over the lake to once again draw the enemy fire. Popsie joined him and the flak seemed uncertain where to shoot. A for Apple went on through unhindered and planted clean and well. A pilot named Maltby went in next and made another clean hit, after which the cry went out from every Lancaster: "It's gone. It's gone!"

When Gibson swung in dangerously close he saw that a ragged hole 100 yards across and 100 feet deep had been blasted out. The lake was pouring out in a savage jet more than 200 feet long. It was smooth on top, foaming at the edges, and boiling over the scarred earth where once a powerhouse had been.

Gibson told the rest of his force to "skip it" and took them on down to the Eder. Those who had dropped their bombs and were still airborne, were ordered home.

This was the leadership that brought Guy Gibson the Victoria Cross.

At Scampton the wait between reports on each bomb was harrowing. It seemed like half an hour, although the bombs were dropped at five-minute intervals. When the final report, the one word "Sambo," which was the name of Gibson's dog, came through, Barnes Wallis danced a jig, and Air Vice Marshal Cochrane said to him, "Wallis, I didn't believe a word you said about that damned bomb, but now you could sell me a pink elephant."

Three kilometers below the Moehne dam lay the sleeping village of Himmelforten, which translated means the Gates of Heaven. The village priest who was awakened by the explosions, guessed immediately what had happened and rushed out to his small stone church to ring the tower bell. It was the signal he had arranged with the villagers three years before, for Father Berkenkopf thought that one day, or night, the British might strike at this great artery.

The bell clanged clearly for several minutes, but was finally muffled

by the angry roar of the oncoming water. Father Berkenkopf was still tolling the bell when the mad flood crushed his church, his village, and then rolled them into debris across the valley. One hundred and thirty-four million tons of water cannot be stopped by a bell, not even a bell sounding from a church in the Gates of Heaven.

Gibson and the rest of the Lancasters had difficulty finding the Eder, for fog was filling its valley. They circled the area several times before they were certain that it was directly below them. One by one, they found it and Gibson put them into a left-hand circuit while he sat above and directed his show.

There was no flak but the Eder lay in the deep folds of the hills with ridges 1000 feet high, making it a dangerous place for heavy aircraft to maneuver. One by one, they tried to get in, but time after time they failed to get down low enough. One pilot made five attempts and then pulled away to look over the situation more carefully. The first Lancaster to drop its bomb missed its proper level, and the great missile exploded on the parapet and probably took Z for Zebra with it, for the crew was never heard from again.

The next Lancaster to get in properly hit the base hard, but it was not enough; the great concrete wall held. By that time there was only one bomber left with a Wallis earthquake in its belly. Pilot Knight went in for his first run, failed to get down low enough and had to pull out. He circled again and took his time. Everyone in the formation gave him plenty of advice, but Knight sat it out until he was ready. He dived down again and his guide light ran along the lake and he put his bomb in perfectly. Seconds later the water erupted, and as it parted Gibson saw the wall of the dam burst open and the torrent go crashing out.

Another two hundred million tons of water went on a savage rampage across the Ruhr. The Eder valley was steeper and as the flood foamed and roiled down, it was more spectacular than the Moehne break for it snapped and writhed like a giant snake. The airmen saw the raging Eder waters, accelerating at thirty feet a second, devour small villages, lone cottages, standing vehicles, schools, churches, and storage barns. Nothing could stop the wild rush as it charged across the hapless countryside.

Joe McCarthy was the only one to get to the Sorpe, which was

tucked down in the rolling hills south of the Moehne. The valleys were clotted with mist and he was some time in pinpointing the lake, but finally he could spot it dimly as something that looked similar to the model he had studied for so long.

Mac tried a dummy run and experienced the same trouble in getting low enough, as had the others at the Eder. There was a hill at each end which forced him to dive steeply and hope he could zoom out at the other end. Twice more he made a test run, but was not satisfied that he was low enough. The moonlight played tricks with the mist, but on the third pass he went in boldly, risked hitting the water, and picked up his aiming point.

"Bomb gone!" his crew yelled, and Mac had climbed well over the hills before it exploded.

"Let's have a look to make sure," the Brooklyn lad said, and went back and made another run down the lake and zoomed over the dam. This time they saw the earth wall had crumpled for more than fifty yards.

"I'm satisfied," McCarthy remarked and headed home.

Of the nineteen Lancasters that went out that night, only ten got away safely from their targets. They were eight tons lighter in bomb and fuel load and could cruise at 245 mph, but the coast was an hour away and the sun less than that. Fighters would be up overhead waiting for the first light that would betray the Britishers.

The head of Britain's Bomber Command, Sir Arthur Harris, decided to put in a call to Sir Charles Portal, Chief of the R.A.F., who was dining with President Franklin D. Roosevelt in Washington. This was important news and Sir Charles would wish to know about it.

The telephone girl who took Harris's Washington call was familiar with the games that inebriated flight lieutenants played, and using what she considered feminine tact answered, "Yes, of course. You've been at it again, sir. Now put that phone down and get your batman to put you to bed."

The explosion at the other end of the telephone was equal to any at the Moehne dam and it was some time before the Operations Room was set in order. When the poor girl realized her mistake she got Washington faster than it had ever before been called, and the

resulting amusement added to the joy that came when Gibson and Co. eventually returned to Scampton.

One Lanc went down to enemy fighters near Hamm, and Dinghy Young, who had earned his nickname from many ditchings, dropped in the Channel. Although Group Headquarters knew about it, there was little they could do, and Dinghy Young didn't paddle back this time.

The lucky ones landed one by one, and were driven to the Operations hut where Harris, Cochrane, and Wallis listened to these young men who had been gone for more than eight hours.

"It was a wizard party, sir," Gibson explained. "We couldn't quiet some of the flak, and I'm afraid some of the boys got the hammer. Still. . . ."

They had an early breakfast of bacon and eggs. Someone opened the bar and, despite the hour, pints of beer were downed as they reviewed the mission. There was no especial gaiety, for 56 men out of the 133 who had gone, were missing. Three had escaped by parachute from a perilously low height and were interned in a miserable prison camp for the rest of the war.

Squadron 617 went on a seven-day leave; that is all except Gibson. He stayed on for two days writing letters in longhand to the relatives of the missing. Fifty-six letters, each one different, telling of his personal grief and loss. No airman ever gave more of himself than Guy Gibson, who was awarded the blood-red ribbon of honor, the Victoria Cross.

It was without question one of the greatest bombing raids of the whole war; the epic blow of an air war in which precision and saturation bombing reached the pinnacle of military efficiency.

When the news of his decoration came through, Gibson picked up the phone and called his chief mechanic, Flight Sergeant Powell, and said solemnly, "Chiefy, if I ever change, tell me," and hung up.

Popular history relates that before dawn of September 1, 1939, "Clouds of bombers and fighters" flew eastward into the skies over Poland and rained death and destruction on helpless towns and villages, on airfields, railroads, bridges, and factories. This is the usual concept of the opening of World War II—that Poland was blasted to rubble in less than a week by Hermann Goering's Luftwaffe.

Actually, such was not the case.

The long-presaged European war began that morning when a number of German planes bombed Warsaw at 5 A.M. There was a low ground mist and considerable fog, so that the tactical forces, Hitler's dive bombers and Stukas, were unable to take part.

The bombers that attacked Warsaw were Junkers Ju 86K types of Luftkreis Number 1 of the German Imperial Air Force. They were commanded by General Major Karl Schweickhard, who had an office at Am Stadtgarten 61-63, Königsberg. Luftkreis Number 1, the equivalent of a wing, was made up of three regional commands, located at Insterburg, Elbing, and Allenstein. The Junkers machine was called a bomber simply because it carried bombs and a few machine guns. It was nothing more than a militarized air transport aircraft, a modified Ju 86.

The accounts of these bombing attacks which were published in the United States did not offer any of these details, for it was considered heresy to detract in any way from the popular concept of German aerial might. For years, self-appointed experts had predicted the obliteration of London, the complete destruction of the Royal Air Force, and the outright supremacy of the Messerschmitt Me 109 fighter.

Some time afterward, it was admitted grudgingly that Poland had not fallen to the Luftwaffe, but had been overrun in a blitzkrieg by General Heinz Guderian's Panzer forces. Hermann Goering had little to do with the victory.

Some twenty German bombers raided Warsaw that first day, and each carried 2000 pounds of bombs. On their first strike two men and three women were wounded. Four such raids on the undefended city resulted in about 800 casualties among the Polish population, and the loss of 13 German planes. Most of the casualties were caused when air bombs of high explosive derailed a train carrying refugees from Warsaw, and the ancient rolling stock tumbled down a steep embankment. One bomb struck a large apartment house and killed 21 people and wounded 30. Another Junkers dropped ten bombs in a field near the Vistula River which left an ineffective ring of small shell craters.

That was on a Friday. By the following Sunday, Great Britain and France had declared war on Germany, but by noon the next day not one bomb had been dropped on London or Paris. However, a forma-

tion of British bombers smothered several German cities with loads of printed propaganda. They could have carried bombs, but it was evident that at this late date the British were still trying to preserve some form of peace.

Some four years later all this came back to me as I stood one night in the bar of the Russell Square Hotel in London during an air raid. It wasn't a large raid but it provided a suitable background.

The man who stood next to me wore the azure blue of the R.A.F. but when he spoke I knew he was not English. He was a sergeant pilot, very tall, with a shock of glistening black hair. He did not remove his greatcoat so I never learned whether he wore any decorations.

As he offered me a cigarette, he said, "Did you see those newsreels today? Did you see that man Stalin almost drop that sword? It slipped out of the scabbard and nearly fell on the floor. That man is supposed to be a great soldier but he doesn't know how to pick up a sword. You saw the newsreels today, eh?"

There was no need for him to tell me he was Polish, but I thought it strange that he should pick out that sequence in the newsreels. I had noticed it when I saw the film a few hours earlier and wondered why the blunder had not been edited. Stalin had been awarded a Sword of Attainment—or something of that order—and in accepting it had almost dropped it.

"That man Stalin," my new acquaintance said, "a peasant who cannot smile."

I agreed that the newsreels from Teheran had shown an interesting contrast in the three great national leaders, but I wasn't prepared to go into the Russian-Polish angle, and so tried to switch the subject.

"What are you flying?" I asked.

"You should ask *why* am I flying," he said thoughtfully. "I am the last of the original 95 who got out in 1939 and came to England."

I introduced myself and we shook hands.

"I still have a family in Warsaw," he went on. "At least I did have, so don't ask me my name. They have thirty million of my people in jail—like your Sing Sing. Over here, we are working in a shadow and not many people know we have practically as many squadrons in the Air Force, as the Canadians."

I could hardly believe that but he was persistent and offered more

facts and figures and stated that Polish squadrons with the R.A.F. had shot down 56 enemy planes during the height of the Battle of Britain. He said that since the opening of the war the Poles had destroyed 600 Nazi airplanes and that he himself had flown more than 700 combat hours over enemy territory.

"But there are a lot of Canadians in British R.A.F. squadrons," I pointed out. "Let's begin from *your* beginning."

"You would like my story, eh?"

"Well, someone might as well write it. Conrad is dead."

"Conrad!" he protested. "He is not the only Polish writer. You must read Casendowski and Goettel. You have read them?"

"Sorry."

"Ah well, I will tell you my story. We lived just outside Warsaw and I worked as an engineer in a small aircraft firm. I was a member of what you call . . . a flying club and I was very happy in those days. Oh, I have been in Russia. I have flown and taken many pictures. I will meet you here again and I will show you some very interesting pictures. You can use them in America, some day, perhaps."

"I don't like using pictures," I warned. "They have to go through the censor."

He pondered on that ridiculous situation for a few minutes and then gave it up.

"I remember the day *they* came," he continued. "I was working at my drawing board and saw an air fight. Do you know our Polish squadrons shot down 760 German planes during those terrible twenty-one days? It wasn't their planes that destroyed us. It was their tanks. Their planes . . . bahl!"

I told him that I had heard that about 600 German airplanes had been shot down in those first three weeks.

"The correct figure is 760."

"Tell me how you got out."

He brushed his hands across his eyes and muttered, "You know, much of it is a dream now. I can't remember leaving. I can't remember what my mother and sister look like. I ran away when *they* came after the men and boys. First, I walked across Poland and got into Russia. In Odessa I got a job on a ship and worked my way across the Black Sea to Istanbul in Turkey. I wandered through Greece, up into Yugoslavia and then had a glorious tramp through the Alps,

passed through Italy and Switzerland and arrived in Paris in time to see France fall. That, too, seems like a dream."

I jotted down the geographical points, as he admired my automatic pencil.

"After France fell I made my way south into Spain and crossed the Mediterranean and got to Morocco . . . Casablanca. Somewhere in that section some British destroyers picked us up and eventually we got here to England. It wasn't as easy as I make it sound now."

"Practically a joy ride, the way you tell it," I commented.

"When I started training there were 95 of us. I am the only one left. I can't quite figure it out now. Breakfast in Croydon, lunch out of a tin over Berlin, and we get back in time for me to drink beer with you in a hotel here."

"You mean you fly over Berlin in the daytime?"

"Oh, yes. I'm on Mosquitoes now. Very fast. Very complex. We go again tomorrow. I will see you here again tomorrow night, eh? I will tell you about Berlin."

I was there, but he never came back.

A few minutes after Great Britain declared war on Germany—the date was Sunday, September 3, 1939—a Blenheim bomber of Number 139 Squadron took off from an R.A.F. station at Wyton with a crew of three; a pilot, the observer who was a naval officer, and an air gunner. They were to photograph the German fleet then moving out of Wilhelmshaven. The machine and its crew had been standing by for three days.

From a height of 24,000 feet the naval officer took 75 aerial photographs of the flotilla, and they returned by 4:50 P.M. and filled in the station logbook: *Duty successful. 75 photos taken of German fleet. The first RAF aircraft to cross the German frontier.*

The following day a second reconnaissance disclosed the German cruiser *Leipzig* near the entrance to Wilhelmshaven, four destroyers in Jade Bay, and two warships at Brunsbüttel at the western end of the Kiel Canal. Twenty-nine Blenheims and Wellingtons took off in the afternoon to attack these units. The weather was very bad with heavy rain and low cloud over that part of Germany and many of the aircraft went astray. One lone bomber reached Brunsbüttel and bombed a warship with no discernible result. Five Blenheims reached

the Schillig Roads. They carried 500-pound bombs fused for a delayed detonation of eleven seconds and they bore up the Roads in open formation at nearly 500 feet above the water. Two aircraft in the rear lost touch with their leader, but three others held formation until they sighted, between rain squalls, a German battleship identified as the *Von Scheer*. The man-of-war was to port of the formation and the Number 2 plane flying to starboard and abreast of his leader, turned sharply, which put him in position to attack first. He went in, but his first bomb missed and the second failed to leave the aircraft.

Meanwhile the leader came in to attack. He went down almost to the surface of the water. A tender alongside the stern of the warship provided some temporary cover. The leader skimmed over this and pulled up just high enough to clear the mast of the *Von Scheer*. His observer saw men leaning against the rails of the vessel and a line of washing hung out to dry. The British bombs fell, and pieces of the catapult gear flew up into the air.

The third Blenheim attacked a second later, but its crew was uncertain whether they had scored.

The attack was a complete surprise.

This formation of Blenheims was followed by five more, which attacked from a very low level. Only one returned and it was feared that the others had gone in so low, they were brought down by the deck explosions of their own bombs.

The British lost five Blenheims and two Wellingtons on this first raid of World War II, and in skill, resource, and resolution these R.A.F. crews clearly showed they were worthy in every way of their fathers—the airmen who fought the Germans some twenty-one years before.

No bombs were actually dropped on German soil until the night of March 19–20, 1940, when an enemy seaplane base on the Island of Sylt was attacked. From September 4, 1939, the R.A.F. efforts were directed toward the destruction of the German fleet. The raid on Sylt was not carried out until the Germans bombed the Orkney Islands on March 16, 1940, when some British casualties were suffered.

Through the winter of 1939–40 Bomber Command attempted to

carry out dozens of offensive patrols, but the equipment was not equal to the task and weather often prevented the completion of many sorties. Almost daily reconnaissance was attempted, and some valuable information was gathered. At times the activity was hopeless and tragic, at others there was the glory of achievement. But generally speaking, the courage and hardihood of the air crews was seldom matched by their aircraft or armament.

On September 29, 1939, two formations of Hampdens sought out and attacked two enemy destroyers, but due to an error in timing, the two formations became separated and when the second reached the area the enemy had been aroused to "alert" standing. All five British aircraft were intercepted by enemy fighters and only one returned. The Germans claimed to have shot them down with a loss of only two fighters. The other formation attacked the destroyers from about 300 feet and were met with heavy pom-pom fire. A well-aimed shell went through the nose of the leading aircraft of the first flight and struck the pilot on the elbow which caused him to pull back on the stick and zoom sharply, and the two following aircraft took the same course, with the result that all the bombs missed their target.

It was decided after this, that bombing attacks on heavily armed and armored naval vessels from such low heights were not worth the risk. More important, the penetrating power of the available bombs was negligible, for they often bounced off the decks or turrets like large Ping-pong balls.

The German warships made a number of sorties into the Atlantic during that inclement autumn, and late in November the *Deutschland* sank the armed cruiser H.M.S. *Rawalpindi* off the coast of Iceland. A striking force of British bombers stood by for days at a Scottish base waiting for the weather to relent and give them a chance to find and attack the German pocket battleship.

Although an Air Striking Force had gone to France to co-operate with the French forces, very little ground action took place. For the thirty-five days of the Polish campaign and for approximately eight months afterward, there was no real war in Europe; and the defensive theory flourished, and fattened the limited-war complex of many leaders in France and Britain.

It was a strange situation. Two of the greatest systems of ground

fortifications faced each other across most of the length of the Franco-German border. Both sides of the area bristled miles deep with "impregnable" concrete and steel casemates. In the Maginot line the French had concentrated the cream of their fortress troops, which were greatly reinforced by Regular Army units. In the Nazi Westwall, or Siegfried line, the Germans had gathered Landwehr, or fortress troops, and battle-trying veterans from the Polish campaign. Both sides were armed with modern weapons, but for nine months practically nothing happened. No single major engagement developed along the whole frontier; now and then patrols clashed in no man's land, and a few minor actions flared up in the Saar Valley.

It was most unsatisfactory to the war correspondents and snide columnists in neutral countries, but the "phony war" was a godsend to the British. They could not have produced the aircraft they were to need, nor the organization to train the crews, but for the breathing space the military doldrums gave them.

However, the crews of the British Bomber Command still tried to blot out the Germany Navy. When the enemy vessels were close to their home bases, the problem was complicated. At a well-defended base, such as Wilhelmshaven, German air fighters maintained a constant vigil, and were quickly in the air to intercept any British bombers that threatened the surface fleet. Much of their warning came from a line of flak ships that patrolled some seventy miles west of Helgoland.

Because of outrageous weather it was not until early December that some twenty-four Wellingtons slipped across the North Sea, sought a number of German warships off Helgoland, and made a sneak raid. Using a new type of armor-piercing bomb, they attacked from heights varying from seven thousand to ten thousand feet. A stick of three bombs scored hits on one of the larger ships—probably the *Brummer*, which was later seen down at the stern and being towed into port.

On the night of November 27–28 six British Whitleys made an unsuccessful attempt to reconnoiter a number of German naval bases. Severe electrical storms played havoc with radio communications and navigation, and the patrol was called off. A short while after twelve Wellingtons found a German battleship, a cruiser, and three destroyers some twelve miles southwest of Helgoland. They had to fly at

almost sea level beneath low cloud to reach that area, and when they were over the enemy targets their height was not more than eight hundred feet. About twenty German fighters engaged them immediately and the ensuing battle lasted for more than forty minutes. This time, by maintaining a tight formation, the Wellingtons drove off the Me 110s, shot down five of them and damaged three more. Five Wellingtons were lost, three of them to antiaircraft fire from the flak ships. Another was the victim of a mid-air collision. The Wellington crews felt that the encounter was most encouraging and proved that the mutual fire-power provided by new power-operated turrets gave splendid results.

They had fought superior numbers and inflicted heavy losses, so a few days later a force of Wellingtons was ordered to bomb a number of enemy naval units reported to be in Wilhelmshaven. Four formations left Britain with instructions to bomb from a height of not less than 10,000 feet. As usual, the weather was atrocious for fifty miles out from the English coast, but it improved later, and over the German coastline the visibility was so good the R.A.F. crews soon discovered that there were no warships at Brunsbüttel in the Schillig Roads or in Jade Bay. Search as they would, no targets came into view until a sweep was made over Jade basin. Here a number of warships were seen close inshore and some were at their wharves. The Wellingtons' leader realized that he could not attack without the possibility of civilian casualties—to date the rule had been that under no circumstances were such risks to be taken—but as he turned away he saw four large vessels in the Roads.

Each one of them sent up a sheet of antiaircraft fire, so the British bombers dropped a few 100-pounders, with no particular result. Then seeing no other targets, the force turned north to pass the Island of Wangerooge where they again received heavy antiaircraft pounding. A number of Me 110s roared in and a running fight raged for half an hour. The 110s opened fire with air cannon at ranges of six hundred to nine hundred yards and pressed home the attacks with determination. The action soon became "general," meaning that formation and unit discipline were discarded. The bombers defended themselves well and six 109s and six 110s crashed in flames; six more, badly battered, were driven off.

On the other side of the war ledger, four Wellingtons were shot

down, three of them with gasoline streaming from their wing tanks, but they were able to get into Holland. Several others had to ditch in the North Sea.

One Wellington was so badly hit that all of its gun turrets were put out of action, but it escaped further damage by using the other planes of its element as cover. It flew low and close in a tight formation so that the enemy fighters could not get another shot at it.

Another Wellington, left behind in a turning movement, came under attack. Its center turret and radio panel were damaged and both tail and front gunners were wounded, so the second pilot left his seat and took over the rear gun where he fought until the ammunition was exhausted. He then made his way back to the nose gun and carried on from there. Meanwhile, the pilot dived to a very low level and escaped.

For some singular reason the British Government decided that propaganda leaflet raids would be profitable. One was staged a few hours after war was declared, and seven such raids were made on successive nights. It was argued in some quarters that it gave Prime Minister Neville Chamberlain an opportunity to set forth the reasons why Great Britain and France were at war with Germany, and at the same time the R.A.F. could gather valuable information on all kinds of objectives; the air crews would become familiar with the layouts, positions, and approaches to airfields, factories, power stations, railroads, and important road junctions. These raids were possibly of some importance in training air crews, since they were carried out in all kinds of weather, and lasted for periods of from six to twelve hours. As tests of endurance and navigation they had no equal.

In the light of what followed, however, hardheaded reviewers have always felt that these dangerous missions would have paid better had high explosive been dropped instead of fruitless printed matter. The author still recalls his resentment in World War I at having to fly deep into the enemy lines to drop bags of such worthless propaganda. It was believed at the time that German ground troops could be induced to desert and become British prisoners, by supplying them with appealing photographs of Donnington Hall, a plush prisoner-of-war camp set up on a noted estate in Britain. In this case the effort backfired when a number of the leaflets fell into the hands of

British front-line troops who set up an understandable revolt when they saw how well German officers were being treated in England.

A leaflet raid was made on Berlin the night of October 1 and this time the sheets told the German public of the amount of personal fortunes hidden away in neutral countries by several Nazi leaders. That night the weather was very bad, and one "white-bomb" plane arrived over the capital at 22,500 feet. Its oxygen supply failed momentarily, two crew members collapsed, and the gun turret doors froze up. The pilot sat it out while the navigator went back to assist the two unconscious crewmen. He dragged the first man a distance of twelve feet, and connected him with a reserve oxygen supply. He then—probably in disgust—tossed most of the bundles overboard before he collapsed.

The pilot then brought the bomber down to 9000 feet, at which time it was possible to unlatch the door to the rear turret and from there the air gunner clambered out and went to the assistance of the navigator. Once, almost normal crew conditions had been restored and the navigator had returned to his plotting table, the leaflet-bomber delivered the rest of the financial news. It has not been recorded whether it was ever taken seriously.

A number of Whitley bombers went to the Düsseldorf-Frankfurt area for a pamphlet attack and in practically all cases, due to the intense cold, it was impossible to lower the turrets from which the leaflets were to be dropped. These situations were encountered in aircraft that had not been designed for subzero work; situations that seldom occurred in later years when better clothing and heating systems were provided.

In one aircraft the starboard engine had to be switched off because it had caught fire. The machine was in a thick cloud at the time and six inches of ice had formed on some sections of its wings, and it went into a dive from 19,000 feet and did not level out until 7000 feet. Even then it took the full strength of both pilots since the rudder and elevators were almost immovable. The radio operator sent a signal to explain that one engine was on fire and tried to get an immediate fix (position), but he had no idea whether he was transmitting as the instrument glasses were coated with ice.

The aircraft was on an even keel but losing height at the rate of 2000 feet per minute. The port engine had stopped and there was

four inches of ice protruding from the inside of the cowlings; the propellers, leading edges and windshields were ice-covered, so the captain of aircraft gave the order to abandon the plane. Neither of the two gunners answered, and the order was canceled. It was ascertained later that the front gunner was unconscious from a thwack on the head from an ammunition magazine, and the rear gunner was out as the result of banging his head when the bomber pulled out of a sharp dive.

By this time the bomber was put into a shallow high-speed dive, and the top hatch was opened so as to see where they were. The ship emerged from the clouds and into heavy rain at two hundred feet. All that could be seen was a black forest with a gray patch in the middle and they headed for this. The second pilot pulled the plane up over the trees and then it pancaked into a field, rumbled on its belly through a barbed-wire fence and skidded broadside into trees on the other side.

The burning engine refused to be doused. The captain searched the fuselage for an extinguisher and discovered it had been discharged in the crash landing. The wireless operator found one in his cabin, climbed on the engine cowlings and put out the flames. By that time it was found that all crew members were safe and unhurt.

Fortunately, they had landed in a friendly section of France and after spending the night in the wrecked Whitley, they were cared for by the kindly inhabitants.

A defect in the oxygen line of another Whitley gave trouble while the crew was distributing pamphlets; the navigator and radioman had to drop to the floor every few minutes to remain conscious. The cockpit heating system was useless. Everyone was frozen stiff. On the way home they dropped down to 8000 feet, but the icing conditions worsened; the windows were completely covered and large chunks of ice were being slung from the prop blades and hitting the metal sides of the control compartment like direct-hit shellfire. All this while the pilots had to keep up a continuous movement of the controls to prevent them from freezing up, but, to the astonishment of every crew member, they returned safely.

A Whitley in this formation also force-landed in France. In this case the set-down was not very smooth and the tail gunner was shaken up. As the bomber came to the end of her run, the gunner climbed

out of his turret and made his way toward the nose to have a word with the pilot. He then discovered that he was alone in the airplane; the rest of the crew had bailed out, but the gunner had not received the order and had rode her down as the plane landed itself.

This may sound incredible, but certain aircraft are so well designed that once they are unloaded, they will fly themselves. In other words, they have been built with what is known as inherent stability, and although unmanned, will assume a normal gliding position and land themselves. If they happen to pick an open area, the chances are that they will make a normal and safe landing.

After the gunner had convinced himself that this was what had happened, he made his way to a nearby village where he found the rest of the crew in a café where they exchanged experiences. The front gunner had been knocked unconscious by the shock of the parachute opening and when he came to he was lying on his back in a field of curious, but friendly cows. The radio operator was not so lucky as he landed in a field of unfriendly bulls, and in spite of his flying gear, took avoiding action by sprinting for a four-foot hedge which he cleared like an Olympic athlete; the captain landed unhurt, but the navigator sprained an ankle.

Enemy opposition was comparatively slight in these early raids; some antiaircraft fire was met and the Germans did try some limited night-fighter flying. These nocturnal flights were successful in a few cases, but most British casualties in 1939 were caused by the bad weather in which many of the flights were made. On one occasion an Me 109 attacked a Whitley and closed to within 500 yards. The rear gunner reported sighting the German fighter just as the captain had given orders for the leaflets to be dropped. He told the rear gunner to hold his fire while the navigator and radio operator dumped the propaganda down the flare chute. The rear gunner reported later that there had been no need for him to take any action since the enemy fighter had flown smack into a cloud of the released leaflets and apparently had broken off the engagement.

The leaflet raids continued on a fairly wide scale right up to the opening of the attack on Norway the following year, and they were still carried out well after the invasion of Normandy, but the chief loads then were aircraft bombs—of the explosive type.

Late in November twelve Blenheim bombers were ordered to

Northolt aerodrome for a secret mission. They were briefed on a new weapon with which the Germans were scoring with annoying regularity. Magnetic mines had become a serious threat to British shipping, and the scientists were working on a de-Gaussing* apparatus. Meanwhile, German seaplanes were flying over nearly every night to spread these deadly mines in the Thames Estuary and along the chief routes of coastal shipping. To counter this, R.A.F. Blenheim pilots were ordered to strafe the enemy seaplane base on Borkum, one of the Frisian Islands. For the first time in the war they would be going into action over enemy territory.

Magnetic mines had been talked about for some years and both belligerents knew that eventually they would be used, but as usual, the Germans produced them first and had briefed a seaplane squadron to deliver them where they would do the most harm. At first, the British had certain qualms about using the magnetic mine, and then disputed which service should have jurisdiction over the weapon. The Air Ministry contended that since it was to be dropped from the air, it was an aviation weapon, but the Admiralty pointed out that it was rightfully their charge, since it was dropped in their waters.

Sir Arthur Harris, who was then a group captain in the Bomber Command, had warned British authorities some nine years before about such a mine, but very little was done about it and no effort made to find an antidote. He now requested authority to be allowed to at least bomb the flare path along which the German seaplanes took off to deliver these mines. This facetious request brought a grudging permission to attack the Borkum seaplane base.

The first raid was termed "a piece of cake" since it was just that. The Blenheims reached the base at dusk and the Germans were caught completely by surprise. The ships struck in four waves of twelve apiece, and pandemonium reigned as the roaring Blenheims skimmed about at less than 100 feet and sprayed the slipways and hangars with machine-gun bullets. A ship in the harbor opened up with a pom-pom gun but was soon put out of action when a bold Blenheim actually flew through a gap in the sea wall and gave its gunners a good chance to spray the decks. The raid lasted but five

* Karl Friedrich Gauss (1777-1855), a German mathematician who developed a system of measuring the force of a magnetic field. His name has long been applied to the science of magnetism.

minutes, five seaplanes were wrecked, some patrol boats were sunk in the harbor, and many anti-aircraft gunners were strewn about their gun mountings. The Blenheims flew back across the North Sea in the darkness and landed without a single casualty. Not one bullet hole was found in any of the aircraft.

The Fighter Command was soon engaged in active service flying. Indeed, while Britain's radio stations were carrying Prime Minister Chamberlain's declaration of war, a flight of Hawker Hurricane fighters was sent aloft to intercept a "blip" on the coastal radio-location stations, which indicated an unidentified aircraft crossing the Channel from Europe and heading for the Thames Estuary. It was escorted in, eventually—a French transport which carried a number of Staff officers. The first night-defense patrol was completed on September 4 when a flight of Number 32 Squadron from famed Biggin Hill flew for ninety minutes in tight formation. The first casualty was suffered by Number 79 Squadron when Flight Lieutenant R. W. Reynolds crashed a Hurricane in a wood near Biggin Hill. At the same period of time another Hurricane pilot decapitated the driver of a motor mower with the wing tip of his airplane. As the plane came to a halt on the turfed field, the mower was still running, with its headless driver sitting bolt upright on the seat.

It was some time before the war was taken seriously by the squadrons of the Fighter Command and several lighthearted episodes occurred. Anti-aircraft defense work was left to the Army—the "brown jobs" in the eyes of the Air Force—and since most of the Army gunners were reservists from World War I, few of them had any idea of the makeup or rank designations of the flying service. As a result, there were frantic efforts to explain that officers with gold braid on the peaks of their caps, were not just warrant officers, but high-ranking Air Force types who should be saluted.

On one occasion, the Army men who had been given the responsibility of defending a fighter station, became excited over some obvious "blips" on their cathode-ray screens. These "invaders" could not be accounted for at any other place, but formations of fighters were sent up and all London guns alerted until it was learned that someone had left open the door of an electric refrigerator and the Army's new

supersensitive Mark VIII detector had picked up the revolutions of the motor.

At another time a group of V.I.P. officials was invited to inspect a new and very secret telephone line that linked Biggin Hill and Knole Park. The system had been giving some trouble, but it was hoped that by the time the visitors arrived, it could be shown for the marvel it was. However, in the middle of the inspection, it was discovered that the trouble was caused by girls of the Army Transport Service who were drying their panties and bras on the line.

The fighter crews stationed in England, and around London, had little to do but keep warm in the last months of 1939. Those in Scotland and along the east coast were scoring on enemy aircraft, but the men who were to fight the Battle of Britain usually were chasing some strange blips which the Army observers saw on the unfamiliar screens, and these episodes often resulted in unprintable parodies in the Gilbert and Sullivan style.

A young American, Flying Officer Jimmy Davies, should be credited with Biggin Hill's first real victory. Davies and a sergeant pilot, Flight Sergeant Brown, were sent off in dirty weather on a routine patrol up and down the south coast. After half a dozen false-alarm calls from Operations they saw a Dornier 17 that was making a weather reconnaissance over the Channel. They had an advantage of 3000 feet over the enemy ship and enthusiastically switched on their gun sights and twisted the safety rings from "safe" to "fire."

For the first time Flying Officer Davies smelled the acrid fumes from his guns seep into his cockpit, and for the first time saw what eight Browning machine guns could do to an all-metal aircraft. The Dornier broke up, rolled over and hit the sea with a satisfactory explosion.

The Nazi party newspaper *Völkischer Beobachter* published a full-page story on October 11, 1939, which announced the sinking of the Royal Navy's *Ark Royal* in a German bombing attack. A Lieutenant Francke was credited with delivering the actual bomb that sank the British aircraft carrier, and was awarded the Iron Cross for his success.

But the *Ark Royal* was in action for two more years and did not strike her colors until November 13, 1941, when she was torpedoed by a German U-boat a short distance from Gibraltar. Only one man

of the 1541 officers and men on board, lost his life in the dramatic end of the great vessel which had played a remarkable part in modern naval aviation.

On September 26, 1939, three British warships, the H.M.S. *Nelson*, H.M.S. *Rodney*, and the aircraft carrier *Ark Royal*, were headed westward across the North Sea, escorting a damaged submarine back to port. Two of the carrier's reconnaissance aircraft were on patrol over the surface ships and just before noon one of them sighted three German Dornier 18s—flying boats—that were shadowing the British force. So the carrier's fighters (two-seater fighter dive bombers) were flagged off to make an attack.

The three Dorniers stayed low over the water and were hard to see, but finally each section sighted the low-flying targets and attacked. Two were badly damaged, but escaped, and the third was shot down by Lieutenant B. B. McEwan and his air gunner Acting Petty Officer Airman B. M. Seymour. This was the first enemy aircraft to be destroyed by any service in the war. A British destroyer picked up the enemy crew of four and cleared up the wreckage of the Dornier.

The attacking force returned safely to the carrier and the C. in C., Home Fleet, signaled his congratulations. There was understandable jubilation aboard the *Ark Royal*, but the day was not yet over. The escaping shadowers had reported the position of the surface force, and half an hour after the last Blackburn Skua had landed on the deck, a Heinkel 111 approached under the cover of a cloud, dived steeply on the carrier from stern to bow, released a 2000-pound bomb, and cleared off in a climbing turn.

The officers on the bridge watched the massive bomb come wobbling down and there was some jesting argument as to what it looked like. "Just like an Austin Seven," one young midshipman explained. "More like a London bus," another argued.

Meanwhile, the captain gave an order to change course and as the *Ark Royal* turned away to starboard, the bomb exploded in the sea about 30 yards from her port bow. A solid wall of water rose as high as the flight deck and cascaded over her fore end. The *Ark* lifted her bow, shook her head, plunged down again and then righted herself. A moment later she was back on course. The only damage in the vessel was some broken crockery.

The Heinkel flew back over the flight deck, sprayed it with ma-

chine-gun bullets and then sheered off in the face of heavy antiaircraft fire.

The German pilot, Leutnant Adolf Francke, reported that he had dive-bombed an aircraft carrier in the North Sea. He believed his bomb had scored a direct hit, but was not certain and made no claim to have sunk the ship. The German Ministry of Propaganda made it for him.

Throughout the Reich the newspapers proclaimed the sinking of the *Ark Royal* in enormous headlines, some of them printed in red ink. Dramatic pictures, by imaginative artists, of the *Ark's* finish appeared in many newspapers and magazines. Field Marshal Goering sent Francke a telegram of congratulations, awarded him the Iron Cross, and promoted him to the rank of Oberleutnant. Within a short time the Goebbels' Ministry of Propaganda published an illustrated children's booklet, *How I Sank the Ark Royal*, purported to have been written by Francke.

Francke's brother officers were not deceived. They knew he was wearing a decoration he had not earned, but they knew also that the poor devil did not dare deny the exploit. He soon became the laughingstock of the Luftwaffe, and the ridicule so preyed on his mind that he thought the only way to save the honor of his family was to commit suicide. He told his story to William Bayles, an American newspaperman who was working in Berlin at the time, and Bayles suggested that if he chose to denounce the Ministry of Propaganda, suicide would be unnecessary.

German broadcasting stations continued to ask: "Where is the *Ark Royal*?" in spite of repeated denials from the British Admiralty that she had been damaged. The United States' Naval Attaché attended divine services on board and wrote an official report of his visit, which was published widely. The officers of the *Ark Royal* sent Oberleutnant Francke an invitation to become an honorary member of their mess, and addressed the note, c/o A. Hitler, Esq., Berchtesgaden. But the German public swallowed the story whole, and months later when the *Ark Royal* was in Rio, the German colony there protested that she must be another ship bearing the same name.

Nevertheless, during the next two years both the Germans and Italians had good cause to know that the *Ark Royal* was still on the surface of the oceans. Her deck fighters shot down, or seriously dam-

aged more than 100 enemy aircraft; she protected many convoys in the Atlantic and the Mediterranean, and her torpedo bombers brought havoc to the airfields of Sardinia, flailed the Italian fleet, and "encompassed" the destruction of the *Bismarck*.

The two-year career of the *Ark Royal* was filled with many firsts in naval aviation and her logbook offers a worthy history of that new form of naval warfare. She received her first cryptic order on September 3—TOTAL . . . GERMANY, the Admiralty cipher sent to every Royal Navy vessel on the outbreak of war. On the morning of September 14, she was almost torpedoed while engaged in an independent submarine hunt. Only the quick report of Leading Signalman J. E. Hall enabled the officer of the watch to put the helm over in time to evade the racing missile. She escaped and put several Skua pilots into the air to take part in an action that blasted two German U-boats to the surface, where they were captured, their crews rescued, and their hulls sunk.

Three days later H.M.S. *Courageous* was torpedoed while searching for submarines and with that, the Admiralty decided that aircraft carriers were too vulnerable for such hazardous duty. The *Ark Royal* was recalled to operate with the Home Fleet.

After a refit, and taking on a quantity of stores, the famed aircraft carrier, along with H.M.S. *Renown*, screened by four destroyers, became known as Force K. By early October 1939 they were sent hurrying south on a mission that had another triumphant ending. Officially, Force K's task was a Trade Protection and Ocean Search exercise in the South Atlantic. In the beginning of November they picked up the German freighter *Uhenfels* which carried a cargo of hides, nuts, copra, and opium valued at \$750,000 and escorted her into Freetown, British West Africa.

A series of sinkings by the enemy indicated that a German raider—now believed to be the *Graf Spee*—was operating in the area, and the *Ark Royal's* period in port was cut to less than twenty-four hours.

Within a short time the cruisers *Ajax*, *Exeter*, and *Achilles*, with the aid of their Swordfish reconnaissance planes, had driven the German battleship into the Rio de la Plata. Force K raced from Cape-town harbor to join in the fray, but the German commander scuttled his ship outside Montevideo harbor, and the British Swordfish were deprived of their prey. During this historic chase the *Ark Royal* had

steamed 75,000 miles and her aircraft had flown nearly 5,000,000 miles.

When the Germans invaded Norway in the spring of 1940 the *Ark Royal* was sent into action in the thick of the campaign. The carriers' tasks were to protect naval ships and convoys, to give cover to the troops at the landing beaches, and to attack German-occupied bases in Norway. The Swordfish and Skua airplanes were limited in performance and speed, and unfitted to operate against land-based aircraft, but they had to accept the risk since the Royal Air Force had no fields in Norway. The distances were too large to send any but long-range fighters from British bases, and not many of these were available. When they did arrive they could not spend more than an hour in the combat area.

Between April 24-28 the *Ark Royal* gave fighter protection over Namsos and Andalsnes where British forces had landed to attack Trondheim from the north and south. The Skuas flew to the limit of their endurance and fought many gallant combats, sometimes against odds of six-to-one.

Though they were outnumbered and outranged, they established moral ascendancy over the enemy, shot down at least twenty German aircraft and damaged as many more. On April 27 five Skua fighters attacked two Junkers 88s that were dive-bombing on a convoy entering a harbor. Both Junkers had to turn away as their engines were on fire, and the Skuas then blazed at a number of Heinkels, two of which crashed in flames. Two Dornier 17s were driven off, and soon a ragged formation of fifteen Heinkels joined the fray. The aircraft-carrier Skuas stayed until every pilot had expended his ammunition; some kept on making dummy passes against the raiders, put them to flight and made most of them jettison their bombs.

Only one Skua was shot down in action, but eight others were lost since they had pushed too hard and did not have enough fuel to get back to their flight decks.

While the Skuas were acting like land-based fighters, the ancient Swordfish, affectionately known as "String Bags," were bombing Vaernes airfield nearby. This raid was made in broad daylight from 6000 feet against heavy flak opposition, but all the hangars and many other buildings were demolished.

There was no rest for either fighter or bomber crews. They flew day

after day up and down the beautiful but treacherous fiords, seeking targets, and usually "escorted" by Heinkels and Junkers overhead. One pilot sent back a laconic signal: "Am being delayed by three Heinkels." The usual evasion tactic under such a condition was to drop down to a few feet above the water, and hope to fly out of the winding fiords, and outgame the enemy.

Many of the *Ark's* crews returned to their ship after forced landings on frozen lakes, in snowdrifts, or in the sea. Sometimes ships that were close at hand gave prompt assistance. Sometimes the crews reached safety after trudging many miles over mountains and deep snow. They were clothed, fed, hidden, and then guided through the enemy line by friendly Norwegians.

A Skua on fighter patrol over the Andalsnes area, having shot down a Heinkel 111, was forced to land when its fuel gave out. It came down within a mile of the crashed Heinkel, and both crews sought refuge in a nearby house. An armed Norwegian appeared and knowing neither English nor German, had trouble determining between friend and foe, but the British crew succeeded in establishing its identity. (One of the Germans flourished an automatic pistol and was promptly shot.) Although they had never used them before, the British pilot and his gunner borrowed skis and reached safety on the coast some fifty miles away.

A young midshipman Skua pilot who was flying alone was separated from his section after an air combat. Shortage of fuel compelled him to land on a frozen lake alongside a damaged R.A.F. Gladiator. He was advised to leave at once because of the presence of German aircraft and the possibility of a new attack. So he filled up the Skua tank from the wrecked Gladiator, borrowed a Norwegian school atlas, and flew across 350 miles of sea. He made a good landing in the Shetland Islands, where he refueled and flew to a naval air station.

The *Ark Royal* was the day-by-day target of the Luftwaffe, which seemed determined to sink her and justify the unhappy Oberleutnant Francke story. At one time she was attacked almost continuously for twelve hours by Heinkels and Junkers which scored ten near-misses, but no hits. When the British forces were withdrawn from the Trondheim area, the *Ark* was ordered north to give air protection to their troops attacking the iron ore port of Narvik, until the R.A.F. fighters could be based ashore.

To get there she had to cruise within 100 miles of the enemy and was continually in action for the next two weeks. Flying began at midnight and continued until 11 P.M. the next day, since there was no night. Fog, low cloud, and bad weather hampered the fighters and sometimes the swell was so deep the motion of the ship made deck take-offs and landings impossible. The Germans were now using the Heinkel 117 type of improved performance, and the Skuas were unable to catch them. During the Narvik campaign the *Ark Royal's* Skuas destroyed or damaged six enemy aircraft, and probably nine more that could not be confirmed. Nine Skuas were lost, including one which crashed on its own deck. Five Swordfish were also shot down.

Once Narvik was made useless for further iron ore production, the British evacuated northern Norway, and the *Ark Royal* and *Glorious* provided fighter protection for the homeward-bound troop convoys.

The *Glorious* was sunk on June 8 and in retaliation the *Ark Royal* sent off a striking force of fifteen Skuas, each armed with a 500-pound bomb, to attack the battle cruiser *Scharnhorst* in Trondheim harbor.

The British aircraft had to fly 160 miles and watchers on the coast gave the alarm twenty minutes before they reached the attack area. As they approached Trondheim at 11,500 feet they sighted the *Scharnhorst*, with two cruisers and four destroyers, lying at anchor. They were met with intense antiaircraft fire and fleets of Messerschmitt 109s and 110s, and under these conditions perfect bomb runs were impossible, so no real damaging hits were claimed.

Eight of the fifteen Skuas failed to return and the claim of one— and possibly two—hits on the *Scharnhorst* was small compensation for the loss of sixteen pilots and observers.

The *Ark Royal* next engaged in the distressing fight against French naval forces in Oran harbor, when the battleship *Bretagne* and two destroyers were sunk, and the *Dunkerque* forced to run aground. The carrier was sent home three days later to prepare for a long battle session against units of the Italian Aeronautica in the Mediterranean. The persistent searching of her Swordfish resulted in the detection of the German battleship *Bismarck* and its subsequent sinking.

On November 13, 1941, while steering toward Gibraltar, a torpedo from a German submarine tore into the famous British carrier. At the time the damage seemed reparable, but after a few hours of care-

ful steaming, water had reached the starboard engine room, and from that time on it was impossible to correct the 20° list. She went down with the loss of but one seaman.

The Germans at last had sunk the *Ark Royal*, but she had set up a gallant tradition for all aircraft carriers.

An unexpected struggle broke out in October 1939 when Soviet Russia staged a clear-cut act of aggression against Finland, a small northern neighbor. After the German-Russian partition of Poland, Russia immediately forced nonaggression pacts with Lithuania, Latvia, and Estonia, which the outside world interpreted as factors of the secret clauses in the earlier German-Soviet nonaggression covenant. It was obvious, later, that the Kremlin was extending its defensive frontiers as far as possible, with a view to the events of 1941.

The Soviets at first made demands on Finland similar to those of the other Baltic countries; specifically, they wanted certain islands in the Gulf of Finland as a protective screen for their naval base at Kronstadt and other cessions of territory that would improve the vulnerable defenses of Leningrad.

When negotiations broke down late in November 1939, the Russians bombed the Finnish capital of Helsinki. This was followed by the terrible winter campaign in which both sides fought in temperatures that fell to 60° below zero. For a short time 330,000 Finnish soldiers fought 450,000 Russians to a standstill. The weather favored them and they had the advantage of well-organized interior communication lines, and a natural defense bulwark of marshes, lakes, forests, and fortifications known as the Mannerheim line.

The Finns had very little in the way of air power and their navy was no match for the invaders. For a time the Russians made some inroads, but their well-laid plans were poorly executed. The Finns fought spectacularly and scored three amazing victories with their highly mobile forces, as they moved on skis and only made withdrawals when Russian bombers flattened their supply bases.

The famed Russian T-34 tank was tried out and proved itself in the Finnish campaign. The Finns had nothing to put up against this terrifying weapon. General Gregory M. Stern had been called in from the Far East and he went at the Mannerheim line with German blitzkrieg tactics that soon broke the back of the Finnish resistance.

On March 13, 1940, an armistice was requested and signed, the terms of which gave Russia everything she had asked for previously, including the right to build a railroad across Finland, connecting the Leningrad-Murmansk line with the Gulf of Bothnia.

Even then, the democratic world missed the point of this puzzling campaign. Why had Russia attacked Finland? Why had she taken such a risk in prestige by staging a war in midwinter? Why had Hitler sanctioned the campaign? Why did the Führer act as an intermediary in the peace negotiations and hold off the Allies from sending aid to Finland?

Eighteen months later, when Hitler's Panzers struck to the east, all these questions were answered.

At the beginning of World War II, a Regular Army lieutenant colonel, Dwight D. Eisenhower (whose name was frequently misspelled in public print) was serving as senior military assistant to General Douglas MacArthur who had been assigned the formation of an independent Filipino military establishment. At the time the U. S. Army's enlisted strength in the United States—including the Army Air Force—was less than 130,000 men and was made up of three organized and six partially organized infantry divisions. There was nothing resembling an armored division; the tank forces available numbered less than 1500 men. The Air Force, which looked impressive in the glossy aviation magazines, consisted of 1175 planes and about 17,000 men to service, maintain, and fly them. Another 45,300 soldiers staffed garrisons from the Arctic Circle to the Equator, and from Panama to Corregidor.

Late that same summer the Germans were massing 60 infantry divisions, 14 mechanized and motorized divisions, 3 mountain divisions, more than 3000 aircraft, and thousands of first-class tanks and armored cars.

During the summer and fall of 1939 Congress voted two increases that raised the Army forces at home and overseas to 227,000, and there the military strength of the U. S. remained during the eight months that Germany readied her full might for the planned conquest of Western Europe. The American public still believed that the Atlantic Ocean would insulate them from any conflict in Europe. The probability that they might be drawn into an Asian conflict was never

considered—except by radio comedians who made the most of the humorous possibilities. (The Japs couldn't shoot straight—they had that Mongol-fold in their eyes!)

When the Nazis seized Denmark and Norway in the spring of 1940, America showed some signs of uneasiness, and by the middle of June the Regular Army's authorized strength had been increased to 375,000 men. By the end of August, Congress had confirmed mobilization of the National Guard, and six weeks later conscription, cautiously referred to as Selective Service, was in operation. By the summer of 1941—two years after the war in Europe started—the Army of the United States numbered only 1,500,000 men, although it was the largest peacetime force ever mustered.

The attack on Pearl Harbor was less than four months away when, by a one-vote margin in the House of Representatives, Congress passed the Selective Service Extension Act, which permitted the movement of all Army components overseas, and extended the term of service.

In the next three and one-half years America produced the greatest fighting machine in the world. It played the feature role in beating Germany to her knees while, almost singlehanded, it conducted a decisive war against the Japanese Empire.

The build-up of the U. S. Air Service was another great factor in the defeat of the Axis. In September 1939 the U. S. Air Corps had only eight hundred operational military aircraft, of which seven hundred, compared to the equipment of the warring forces in Europe, were obsolescent. Only the Douglas A-20, a medium bomber of the attack category that had been developed for the French, could be considered first-line equipment. Of the U. S. bombardment aircraft in service by September 1939, only the Boeing B-17 Flying Fortress flew as a first-line combat bomber during the war.

Toward the end of 1939 the British and French governments had ordered 2500 aircraft from manufacturers in America, and before March of 1940 the requests were increased to 8200. These orders included modified types of the Lockheed P-38 fighter, and the Boeing B-17, Consolidated B-24, North American B-25, and Martin B-26 bombers. When France was defeated in 1940, Great Britain took over all French contracts and by July of that year had on order 8275 American aircraft and 21,485 engines. How many of these were de-

livered, is a question, but the contracts certainly enabled American aviation industry to tool up and expand for the tremendous output that was needed later.

It is generally admitted that France had the finest army in the world in 1939. She had as many armored tanks as Germany, and the spirit of her *Armée de l'Air* was as high as that of any aviation force to be involved; in fact in 1923 there had been some concern about the French occupation of the Ruhr, and the size of the French Air Force when they had 128 air squadrons. Even Britain was troubled since she had but 371 so-called military aircraft in service. But during the years between the wars political interference reduced the French Air Service, and by 1939 their equipment was second-rate.

When the Munich crisis developed, France, as did Great Britain, bought or ordered up-to-date fighters and bombers from the United States to augment her stock of necessary equipment. Had she been able to stay in the war through the summer of 1940 she would have had 2600 ultramodern military planes, of which about 900 would have been fighters.

Before the hostilities began, conscription provided plenty of man power and the French were naturally good fliers, as was proved in World War I, but the General Staff thought only in terms of fighting and bombing; the overall theory of tactical or strategic aviation was never considered seriously. Other than their seaplane activities with the fleet, the *Armée de l'Air* built its air power on fighters and bombers. A glance through the complete list of French service craft of the time, discloses that of the twenty-nine types available, twelve were fighters, ten were bombers, four were reconnaissance-bombers, and one a torpedo-bomber.

The French concept was offense; they would either fight in the air, or bomb the enemy. The Free French airmen who escaped from France to fight with the British were chiefly fighter pilots, or partially trained men who wished to be fighter pilots. They tried to explain the defeat of the French Air Force by pointing out that the politicians made certain that the air heroes of World War I—the men who created the great tradition—were allowed no voice in the councils of the nation. After 1919 the spirit of Guynemer, Madon, Fonck,

Nungesser, and Heurteaux was quickly dissipated by the squabbling and ineptitude of the men in the government.

Toward the end of 1938 it was apparent that France was not keeping pace with the air-war race then openly under way throughout Europe, and to supplement home production, she placed orders in the United States for one hundred Curtiss Hawk 75-A single-seater fighters. This amount was increased later to an additional one hundred Hawk 75-As, plus one hundred fifteen Martin 167s and one hundred Douglas DB-7 twin-engined bombers. Two hundred North American NA-57 trainers were also ordered, but many of these aircraft could not be delivered in time, and so fifty Koolhoven FK-58 single-seater fighters were contracted for in Holland, of which only eighteen were delivered.

On the morning of May 10, 1940, the Nazis began a co-ordinated attack on French air bases at Metz, Nancy, Romilly, Dijon, and Lyon with medium and dive bombers that were heavily escorted by fighters.

The strength of the German forces has always been greatly exaggerated. At no time during the blitzkrieg against Western Europe did their air strength exceed 2890 fighters and bombers, to which could be added 640 army co-operation reconnaissance aircraft. Actually, there was no large disparity between the relative strengths of the attacking and opposing sides, as was claimed by French authorities later. French fighter forces that were based between Belgium and the Swiss frontier were made up of twenty-three fighter groups, each with twenty-three aircraft, and there were reserve parks with plenty of spare fighter aircraft available. In addition, the French had 260 first-line bombers, 180 reconnaissance aircraft, and 400 army co-operation types. There were 314 military aircraft in North Africa.

Unquestionably, the *Armée de l'Air* was poorly handled and caught off guard. Instead of being in position and condition to fight, it was involved in extensive re-equipment, and many of its air crews were not trained to handle or fly the new aircraft. The Luftwaffe made the most of the situation, employed the element of surprise, flew continuous low-level attacks on French air bases and destroyed much of the aircraft on the ground. Combined with this, the rapid advance of the German Panzer and infantry forces overran airfield after airfield, necessitating withdrawal, which dislocated both combat and support organization.

However, between May 10-31 French fighters destroyed 350 Luftwaffe aircraft and were credited with 145 "probables." One of their principal missions was ground-strafting the advancing German columns, generally in the face of heavy ground fire, to which the liquid-cooled engines of the Morane-Saulnier 406 and Dewoitine .520 were particularly vulnerable. Almost 70 per cent of the fighter losses occurred during the low-level operations.

What tactical assault efforts were attempted against the advancing armored columns, turned out to be hopeless; the equipment was unsuitable and the lack of self-sealing fuel tanks caused high losses. Only the reconnaissance planes carried out their duties with any efficiency, but due to the failure of the rest of the service, there were few reconnaissance missions.

When Paris had been occupied and General Guderian's Panzer forces had clanked as far forward as Dijon and the Saône by June 17, 1940, Marshal Pétain sought surrender terms, but the French Air Service was still fighting when their government capitulated on June 23. They had more operational aircraft available then than at the start of the German offensive. From June 18-20 the Dewoitine .520 fighters and Hawk 75-As of ten groups were ordered to North Africa, but the remainder of their elements based in France were left to be disbanded according to the terms of the armistice.

On July 3 the British Navy launched an attack on the French fleet at Mers-el-Kebir to prevent its possible use by the Axis powers, and the German government rescinded its demand for the disbandment of all French Air Service elements, and agreed to the retention of some units for protection of France's North African possessions.

The retained forces, referred to as the Vichy Air Force, included 6 fighter groups, 2 night-fighter groups, 6 bombardment groups, and 3 reconnaissance groups. All these units were based in unoccupied France and the fighter pilots were allowed to fly four hours per month, and the bomber and reconnaissance pilots six hours per month. Although all these units were never at their full establishment, the Vichy Air Force was a redoubtable component with about 800 aircraft always at combat readiness.

How much active service flying was done by the French through the latter months of 1939 and before capitulation, is hard to ascer-

tain. Few authentic records are available, and what were kept probably were destroyed when the Germans moved toward Paris.

Russia, who finally joined the Allied powers, had been depicted for a long time as the big bad wolf of military power. Her vast area, her enormous population, and her unlimited supply of fuel-producing petroleum had made her—on paper at least—one of the greatest fighting threats. For more than a decade preceding World War II the Russian war machine was presented as capable of overrunning any smaller nation within a few weeks. Stalin's tremendous manpower and resources would soon beat down the most advanced military state.

Russia was said to be one of the leaders, if not *the* leader, in world air power. Although they had no official figures, most experts were certain that Russia could put from 6000 to 10,000 first-line fighting planes into the air at the outbreak of any war. We were warned of the formidable Russian parachute troops and told that many schools in the Soviet had 'chute jumping towers where practically everyone learned how to "take to the silk."

Except for the Sino-Russian operations in 1929, Russian airmen had had few chances to test their equipment in the field under service conditions and when the Spanish revolution broke out in July 1936, the Russian government seized the opportunity to evaluate their latest type of aircraft by sending aid to the Republicans. By October of that year Russian technicians and a group of their SB-2 bombers, R-5 reconnaissance bombers, RZ assault aircraft and some I-15 and I-16 single-seater fighters were sent into action. In the following two and one half years of fighting, the Soviet put many other types into battle. Russian aircraft were continually in action against the Spanish Nationalist forces and the aircraft of the *Legión Cóndor*, and the Italian *Aviación Legionaria*.

Despite considerable Russian assistance, the Republicans lost the war, but the Russian Air Force gained important experience. Their I-15 and I-16 fighters had proved their worth over most of the enemy equipment encountered. Although their SB bombers were effective, they were poorly armed against fighter opposition. The Nationalist forces claimed to have destroyed one thousand Russian aircraft during the war.

In the attack on Finland, Russian airmen had an opportunity to

test their theories of mass bombing raids and strategic thrusts at fixed installations and cities. Close support operations were most difficult over Finland's heavily wooded country, and although they had about nine hundred first-line fighters, the Russians met unexpected opposition. More than 280 Soviet aircraft were shot down in action, and 314 were felled by Finnish antiaircraft defense. But quantitative superiority finally overcame the opposition when by January 1940 the Russians had sent 1500 aircraft into the campaign.

In 1939 Russia had twenty-four military aviation schools, only nine of which furnished flight training; the rest were technical schools. From all reports most of these institutions suffered from the mismanagement common in Russian factories during the Five-Year Plan, the lack of an intelligent approach, and too many political officials. Much of the flying equipment used by the Russians was not very impressive. There were several interesting airplanes, but few sound basic types on which to build a formidable air force, and there was much evidence of their copying foreign types in which the worst features were often pointed up.

Russia manufactured one or two bomber-transport planes that were generally useful for quickly moving troops from one place to another, and there were reports of five single-seater fighter types, six light and medium bombers, three reconnaissance planes, two two-seater fighters, one ground-attack plane, and four seaplanes.

Their fighters included a copy of the old Bristol Bulldog, known as the I-5, and another biplane fighter built under Heinkel license, which was powered with a 600 hp engine, carried four machine guns and had a top operating speed of 210 mph.

Soviet bombers were an amazing collection, ranging from low-wing to high-wing monoplanes. Most of them were powered with four engines, but produced little in the way of performance.

Two types that were purchased in the United States prior to World War II were the Martin 139-W bomber and the Douglas DF flying boat, but the Russians were unable to obtain enough of these to make a real showing when Hitler struck. It will be recalled that once we joined the conflict, we provided hundreds of fighter aircraft for the Russians, but, considering everything, the Soviet subscribed little to the field of air power or air operations during the war.

Her greatest contribution was through infantry man power, and the development of the T-34 tank.

A fairly complete list of Russian military aircraft—a list selected and detailed by Dr. Denys J. Voaden, a British authority on Soviet military history—is presented later on in this book.

As she did in World War I, Italy took a neutral attitude for several months in 1939. Mussolini was beholden to Hitler on several counts, but it was obvious that he wanted no part of World War II until he thought he knew which way the dice would fall.

Italy held a key position in the Mediterranean in the First World War and she played both sides until Allied diplomacy won her over, but she did not declare war on Austria-Hungary until May 23, 1915, and on Germany in August 1916!

Although it must be admitted that Mussolini had little choice, it was a great mistake for him to join Hitler; it would have been wiser to have cast in his lot with the Allies. Actually, the Italians had little to offer either side. Their army was blocked off by the Alps and their navy was trapped in Taranto harbor and put out of action one afternoon by the British Fleet Air Arm. However, Mussolini's air service should have been one of the best in the world, and why it did not live up to its potential, is difficult to explain.

The pathetic stand of the Italian Air Force in the almost-forgotten Abyssinian campaign, has not been fully understood. It won small acclaim for its cold-blooded rampage against the defenseless Ethiopians, and gained little prestige in the Spanish Civil War. In 1935, Il Duce had 1500 first-line aircraft standing on his military airfields, 35 per cent were fighters, 35 per cent bombers, and the remainder army co-operation planes.

In the Spanish action neither their fighters nor their pilots were of much value. Their bombers were first-class, but carried no precision bombsights. Their widely renowned engines turned out to be duds under active service conditions. The Fiat, Alfa-Romeo, Piaggio, and Isotta-Fraschini power plants were beautiful to look at when mounted on an aero-show display platform, but after the Spanish Civil War most of them were replaced by British Bristol Pegasus, Jupiters, and French Gnome-Rhone engines.

Mussolini, who was a trained airman capable of flying a first-class bomber, took an active interest in the Italian Air Service and ap-

pointed the famous ocean flyer, General Italo Balbo, to set up a special corps of aviation engineers. He then divided the country into four military air zones with headquarters at Milan, Padua, Rome, and Bari. A study of the Balbo regime discloses that the Italian Air Service was not designed for home defense, but for territorial advancement. Since the Alps were a natural barrier against invasion from the north, more attention was given to coastal defense, which accounts for so many seaplanes and flying boats in the service just prior to 1939. That Italy was looking to the south, either to extend her empire, or to build up some form of resistance in the Mediterranean, can be seen from the fact that over the previous years she had built many fortified airfields along the Adriatic. The island of Sicily was strongly fortified and equipped with several airfields and seaplane bases. Sardinia also contained military seaplane bases, while the valley of the Po along the northern reaches had less important defensive areas.

From Sardinia and Sicily, Italy could attack French Tunisia and Algeria, or even attempt a raid on Marseilles; although she would have to expect counter attacks from the French bases in Corsica and Berre.

Italy built up a suitable air force for Mediterranean action, but had little to offer either Hitler or the Allies in a European war. History shows how she tried to play her part in the Mediterranean and made the mistake of not realizing the full value of land-based aircraft. Her navy was no match for the British, and Hitler was unable to bring suitable help when it was needed most. So long as Britain held both ends of the Mediterranean—at Suez and Gibraltar—Italy was doomed as an Axis partner.

Hindsight tells us that had the United States shown a strong hand in favor of France and Great Britain earlier in the war, Mussolini might have pressed the point that the Germans were trespassing on the Brenner Pass as an excuse to ignore Hitler's unreasonable demands, and that move might have shortened the war considerably.

MILITARY AIRCRAFT OF THE FIGHTING POWERS (1939-40)

GREAT BRITAIN

Single-Seater Fighters

TYPE	ENGINE	TOP SPEED	ARMAMENT
Gloster Gauntlet	645 Mercury	230	2 Machine Guns
Gloster Gladiator (These were the last of Britain's biplane fight- ers.)	840 Mercury	250	4 Machine Guns
Hawker Hurricane (Many versions of the Hurricane were devel- oped over the ensuing war years. They were produced as intrusion bombers, deck-fighters and night fighters.)	990 Merlin	325	8 Machine Guns
Supermarine Spitfire (The Spitfire was basi- cally a lightweight de- fensive aircraft. Most maneuverable, but of short range. Many ver- sions of the plane were developed before the war ended. A number known as Seafires were provided for the Fleet Air Arm.)	1025 Merlin	395	8 Machine Guns
Hawker Nimrod	550 Kestrel	175	2 Machine Guns

Two-Seater Fighters

Hawker Demon	560 Kestrel	181	3 Machine Guns
Hawker Osprey	640 Kestrel	181	3 Machine Guns
Boulton & Paul Defiant	1065 Merlin	300	6 Machine Guns
Blackburn Skua (This was actually a Naval fighter-bomber.)	905 Pegasus	225	3 Machine Guns

GREAT BRITAIN—(cont'd)

Bombers—All Classes

TYPE	ENGINE	TOP SPEED	ARMAMENT
Fairey Battle	1035 Merlin	257	2 Machine Guns
Bristol Blenheim (Later redesigned to a night-fighter.)	825 Mercury (2)	285	3 Machine Guns
Handley Page Hampden	850 Pegasus (2)	254	3 Machine Guns
Handley Page Hayford (The last of the heavy- bomber biplanes.)	1050 Kestrel (2)	142	3 Machine Guns
Handley Page Harrow	1850 Pegasus (2)	198	3 Machine Guns
Hawker Hind	640 Kestrel	186	3 Machine Guns
Armstrong-Whitworth Whitley	840 Merlin (2)	192	4 Machine Guns
Blackburn Roc	900 Perseus	225	4 Machine Guns
Blackburn Shark	700 Tiger	152	2 Machine Guns
Fairey Swordfish	690 Pegasus	154	2 Machine Guns
Vickers Wellesley	835 Pegasus	226	2 Machine Guns
Vickers Wellington	980 Pegasus (2)	247	4 Machine Guns
Fairey Albacore (This was an advanced torpedo-bomber.)	1065 Taurus	237	3 Machine Guns

FRANCE

Single-Seater Fighters

Nieuport 161	860 Hispano	247	Air-Cannon Fighter
Nieuport 210 (Navy seaplane fighter.)	720 Hispano	173	2 Machine Guns
Dewoitine D.500	500 Hispano	226	2 Machine Guns
Dewoitine D.510	860 Hispano	250	3 Machine Guns 1 Air Cannon
Morane-Saulnier 406	860 Hispano	310	Air-Cannon Fighter
Bleriot-Spad 510	500 Hispano	375	2 Machine Guns
Dewoitine D.371	930 Gnome-R	240	4 Machine Guns
Dewoitine D.513 (France had no two- seater fighters.)	860 Hispano	298	3 Machine Guns

FRANCE—(*cont'd*)*Bombers—All Classes*

TYPE	ENGINE	TOP SPEED	ARMAMENT
Bloch 131	880 Gnome-R (2)	248	3 Machine Guns
Bloch 210	870 Gnome-R (2)	198	3 Machine Guns
Potez 63	670 Hispano (2)	279	3 Machine Guns
Farman 223	1100 Hispano (4)	248	3 Machine Guns
LeO 45	1100 Hispano (2)	300	Unknown
LeO 46	870 Gnome-R (2)	?	4 Machine Guns
Amiot 143-M	780 Gnome-R (2)	189	7 Machine Guns
Breguet 690	680 Hispano (2)	235	2 Machine Guns
Latecoere 298	880 Hispano	186	3 Machine Guns
Latecoere 582	740 Gnome-R (3)	170	3 Machine Guns

GERMANY

Single-Seater Fighters

B.F.W. Bf.109 (This was the original model of the fighter which later was called the Messerschmitt BF 109.)	950 D-Benz	310	3 Machine Guns
Heinkel H.E.12	660 Junkers	316	4 Machine Guns
Focke-Wulf Fw. 190 (These three models were all improved over the war years and became the basic machines for Hitler's fighter strength.)	1550 B.M.W.	370	4 Machine Guns

Two-Seater Fighters

M.E. 110	1150 D-Benz (2)	365	6 Machine Guns
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Bombers—All Classes

Arado 95	880 B.M.W.	192	2 Machine Guns
Blohm & Voss 140	880 B.M.W. (2)	198	3 Machine Guns
Dornier 17	950 D-Benz (2)	292	3 Machine Guns
Dornier 22	860 Hispano	217	4 Machine Guns
Focke-Wulf 58	240 Argus (2)	158	3 Machine Guns

GERMANY—*Bombers—All Classes (cont'd)*

TYPE	ENGINE	TOP SPEED	ARMAMENT
Heinkel 111	1070 D-Benz (2)	260	3 Machine Guns
Heinkel 118	910 D-Benz	261	5 Machine Guns
Heinkel 270	910 D-Benz	279	4 Machine Guns
Henschel 123	610 Siemens	?	2 Machine Guns
Junkers 86K	600 Junkers (2)	225	3 Machine Guns
Junkers 87	600 Junkers	240	2 Machine Guns
Junkers 88	1200 Jumo (2)	310	4 Machine Guns

ITALY

Single-Seater Fighters

Fiat C.R.32	550 Fiat	242	2 Machine Guns
Fiat G.50	850 Fiat	299	6 Machine Guns
Macchi C.200	840 Fiat	314	2 Machine Guns
Meridionali R.41	390 Piaggio	211	2 Machine Guns
Meridionali R.51	840 Fiat	306	2 Machine Guns

Two-Seater Fighters

Meridionali Ro.37	700 Piaggio	201	3 Machine Guns
Meridionali Ro.43	700 Piaggio	196	3 Machine Guns

Bombers—All Classes

Breda 64	650 A.R.	223	4 Machine Guns
Breda 65	870 G.R.	267	4 Machine Guns
Breda 82	1000 Fiat (2)	264	4 Machine Guns
Breda 88	950 G.R. (2)	321	3 Machine Guns
Cant Z.506B	777 A.R. (3)	242	4 Machine Guns
Piaggio P.32	1020 Piaggio (2)	264	3 Machine Guns
Cant 1011	880 Isotta (2)	229	4 Machine Guns
Caproni 101	370 Piaggio (3)	220	3 Machine Guns
Caproni 124	900 Isotta	201	3 Machine Guns
Caproni 135	900 Isotta (2)	267	3 Machine Guns
Fiat B.R.20	1000 Fiat (2)	268	4 Machine Guns
Savoia Marchetti 79	750 A.R. (3)	270	Unknown
Savoia Marchetti 81	700 Piaggio (2)	211	6 Machine Guns
Savoia Marchetti 81B	700 Fiat (2)	?	Unknown

POLAND

Single-Seater Fighters

P.Z.L. P.XXIV.F	900 Gnome-R	270	4 Machine Guns
P.Z.L. P.XI.C	680 Pegasus	214	4 Machine Guns

Bombers—All Classes

LWS. 'Zubr'	710 Pegasus (2)	236	3 Machine Guns
P.Z.L. P.27	710 Pegasus (2)	273	3 Machine Guns
P.Z.L. P.43	950 Gnome-R	226	4 Machine Guns

CHAPTER II *The Phony War*

[1940]

WHILE the ground forces of the belligerent nations appeared to be sitting out the 1939-40 winter and the moody spring that followed, the air and naval services were, nevertheless, creating new chapters of hard-fought history. Not a day passed but some bomber group staged a spectacular raid, or a naval flotilla was engaged in an action that left wreckage, blood-churned waters, and new passages of high gallantry. In France, Britain's Air Striking Force was in violent action twenty-four hours a day. What did they mean, "a phony war"?

One highlight of this derided period was the destruction of four enemy ships by the British Fleet Air Arm with the expenditure of but three torpedoes. This attack was made in the summer of 1940 by Swordfish torpedo-bombers from H.M.S. *Eagle*, which had been disembarked to Dekelia while the *Eagle* was lying in Alexandria harbor.

At the time, Air Commodore Raymond Collishaw, the well-known Canadian ace of World War I, was Air Officer Commanding the Western Desert, and after the aircraft had been ashore a few days he asked for a force of torpedo-bombers to help deal with enemy shipping off the Libyan coast.

One of the squadron observers was sent to the Western Desert headquarters as Naval Liaison Officer and the next day three Swordfish were delivered to Ma'aten Bagush, to take up Collishaw's requirements. They were accompanied by an aged Victoria troop carrier which was loaded with maintenance ratings, toolboxes, torpedo gear, and spare parts. For a few nights, this sub-flight carried

out antisubmarine patrols along the coast with no particular reward, but late one evening they were told that an R.A.F. Blenheim reconnaissance plane had reported a submarine depot ship lying off Bomba Bay and that an enemy submarine had been seen heading toward it.

It was decided that the Swordfish flight should move up to Sidi Barrani immediately, refuel there and await the report of a dawn reconnaissance.

Early the next morning a Royal Marines pilot, Captain Oliver Patch, took command of the sub-flight and selected Midshipman C. J. Woodley as his observer and navigator. The other torpedo-bombers were flown by Lieutenants J. W. G. Wellham and N. A. F. Cheesman. Thanks to Midshipman Woodley's accurate navigation they hit Bomba Bay smack on the nose. Fanning out to about 200 yards, they first spotted a large ocean-going submarine moving dead ahead of their leader. She was steaming at about two knots on the surface, apparently charging her batteries; the crew's laundry was hung out to dry and the scene was most peaceful. Three miles ahead at the mouth of a creek known as An-el-Cazala, a cluster of shipping could be seen.

As the striking force approached, flying just 30 feet above the sea, the submarine opened a vigorous fire on the starboard aircraft, with two machine guns. The rear guns of the port and starboard airplanes returned the fire and with that Captain Patch turned smartly to starboard, then moved back to port and dropped his torpedo from a range of about 300 yards.

As the missile hit the water, the members of the submarine's crew who were on the deck, dove into the sea. A few seconds later the torpedo hit the U-boat amidships below the conning tower. There was a loud explosion that was followed by a cloud of thick black smoke. The submarine broke up in many pieces, and when the smoke had cleared only a small part of her stern was visible above the surface.

Patch then turned out to sea again, having completed his attack.

The two Swordfish piloted by Wellham and Cheesman, flying about a mile apart, headed toward the vessels lying inshore, which they identified as a depot ship, a destroyer, and another submarine.

The destroyer was close-hauled between the U-boat and its depot ship.

The supply vessel opened fire with a few high-angle guns, which were depressed to meet the low-flying torpedo planes. The destroyer joined in with her pom-poms and multiple machine guns while the submarine added to the greeting with her 0.5 automatic weapons. The fire was not well delivered, but one 0.5 slug struck the aircraft flown by Wellham. Neither he nor his observer was injured.

The two Swordfish closed on the enemy vessels and Wellham dropped his torpedo on the starboard beam of the depot ship. As Cheesman was preparing to attack the submarine, his observer noted that they were over shoal water and warned the pilot just in time to prevent his dropping the missile into a sand bar. Cheesman was then forced to fly to within 350 yards of his target to find deep water. Once he released his torpedo he could see it running the full distance until it hit the U-boat amidships. It exploded immediately and set the devastator afire.

Lieutenant Wellham's torpedo struck the depot ship below her bridge and she too began to blaze furiously.

Both Swordfish turned away and headed for the sea, and Cheesman made a right-hand circuit of the Italian fighter airfield at Gazala where he and his observer waved triumphantly to the enemy airmen below. Then a terrific explosion indicated that the magazine of the depot ship had blown up; the three naval vessels disappeared from sight in a cloud of steam and smoke.

When they were forty miles from the coast the two Swordfish sighted an Italian Cant Z-501 flying boat above them, but it flew on toward Bomba without altering its course. They then made contact with Captain Patch and reached Sidi Barrani at 3 p.m., having flown a distance of 366 miles. Wellham's aircraft was found to be unserviceable as a bullet had smashed the extension to the main spar and hammered a bad dent in the fuel tank.

Not unnaturally, the Operations staff was dubious of the crews' claim of four ships sunk with three torpedoes, until photographs taken by a reconnaissance Blenheim brought in complete confirmation. All crews were suitably decorated, and shortly thereafter the Italian radio admitted the loss of four warships to "an overwhelming force of torpedo-bombers and motor torpedo boats."

On the morning of April 13, 1940, H.M.S. *Warspite*, screened by nine destroyers passed through the entrance to Ofot Fiord, leading to Narvik on the northern coast of Norway. Five miles west of Baroy Island the *Warspite* catapulted a Swordfish aircraft with orders to reconnoiter ahead of the force and bomb any suitable targets. The airplane was piloted by Petty Officer F. C. Rice, the observer was Lieutenant Commander W. L. M. Brown and Leading Airman M. G. Pacey was the air gunner. From this point on, at 11:52 A.M., began one of the memorable actions of the Narvik campaign.

Low clouds formed a deadly vault between the steep cliffs of the fiord and as the aircraft proceeded it was like boring through a tunnel. Not too many feet below, the sea was a dirty cobalt. The wind, sea, and thrash of the propeller chanted a wild battle song and the dips and sweeps of the craft kept time to that measure. There was reflective history everywhere; below the licking waters lay the hulks of a hundred offshore battles, now long forgotten, for they have never been recorded.

Minute after minute the lonely dural atom moved along the winding passage of the fiord, seeking and searching. Bewildering forms appeared on the cliffs, frigid mirages danced along the fringed waters that lapped at the rocky shores, until at last Brown spotted a German destroyer steering to the westward. The British tin cans in the van opened fire and the Jerry retired at high speed to get out of range. Next, Rice discovered a submarine resting at anchor only 50 yards from a jetty at Bjerkvik. The Swordfish dived to within 300 feet to release its bombs; the first hit smack on the bow of the U-boat, but owing to the resultant explosion, the second bomb's exact point of impact was not clearly observed. It was either a hit or a near-miss. The air gunner raked the conning tower with several long bursts, and the submarine sank within half a minute, although one bold enemy gunner stayed at his post long enough to open fire and damage the tail assembly of the Swordfish and make it sluggish on the controls. From that point on the pilot had to maneuver carefully for the rest of the flight.

At 12:40 P.M. Lieutenant Commander Brown reported that an enemy destroyer was hiding in a bay 5 miles ahead of the screen, obviously hoping to remain unnoticed against the rocky background;

but it was in a position to fire torpedoes at the advancing force. Thus advised, the British destroyers turned their guns and torpedo armament on the starboard bow, and before the enemy could fire more than one salvo, the ship was heavily engaged. One torpedo from the *Bedouin* and another from the *Eskimo* struck her. She was ablaze fore and aft in three minutes, and salvos from the *Warspite's* guns complete her destruction.

Shortly after this action Brown sighted five torpedo tracks approaching the Force, and gave timely warning. All five passed clear and exploded against the cliffs of the fiord.

Three enemy destroyers were seen sneaking into Rombaks Fiord, which lies near Narvik, and five British destroyers pursued them, while others entered Narvik harbor and attacked another German destroyer which caught fire under the combined attack and blew up. With this, all resistance in the harbor ceased.

The lone Swordfish proceeded to reconnoiter the position in Rombaks Fiord. The *Warspite* was engaging the enemy there and the smoke from her shells, combined with the low clouds and the steepness of the cliffs on either side of the narrow fiord, made observation and visual signaling very difficult. However, at 3 P.M. the Swordfish reported two enemy destroyers at the head of the fiord. The *Eskimo*, closely followed by the *Forester* and the *Hero*, engaged them. The enemy replied with gunfire and torpedoes and the bow of the *Eskimo* was blown away. One of the German destroyers ran aground; the Swordfish roared in, dropped its remaining bombs on her, and she was finished off by gunfire. The other destroyer retired under the cover of smoke to the top of the fiord.

At 3:30 the *Bedouin* signaled that both she and the *Hero* had about exhausted their ammunition and that the remaining three destroyers were lurking round a corner of the inner fiord out of sight, and in a position of great advantage if they still had torpedoes.

Vice Admiral Whitworth on board the *Warspite* replied: "The torpedo menace must be accepted. Enemy must be destroyed without delay. Take *Kimberley*, *Forester*, *Hero*, and *Punjabi* under your orders and organize attack, sending your most serviceable destroyer first. Ram or board if necessary." But when the destroyers churned up the fiord there was no reply to their fire; the enemy had abandoned

the three ships. One had been scuttled, another was sinking, and the third was sent to the bottom by a torpedo from the *Hero*. This ended the main action, and the battered Swordfish that sparked the attack, returned to the *Warspite*, after being in the air for more than four hours. During that time it had passed back vital information concerning the position of the enemy ships, reported torpedo tracks, took photographs, bombed a destroyer, and sank a submarine.

The total German naval force present had been sunk without the loss of one British ship, for both the *Eskimo* and the *Cossack*—which struck a submerged wreck in Narvik Bay—were able to return with the main force.

A forgotten product of the Phony War was Flying Officer Edgar James (Cobber) Kain of Number 73 Fighter Squadron, R.A.F. He was Britain's first fighter ace in the war against the Nazis; a tall man, broad-shouldered, with unkempt black hair. On June 6, 1940, from a height of 20,000 feet over Reims, he shot down his twenty-fifth enemy aircraft. The next day he was dead.

He had no right to die, but he was typical of the traditional fighter pilot of popular history. There was never another Cobber Kain in World War II. He died as the result of his wild, ungovernable vitality and brash exhibitionism.

On Friday, June 7, 1940, Kain, a Hurricane pilot, received orders to return to England for a well-deserved rest, and a light Miles Magister two-seater liaison airplane was furnished for his convenience.

"All your gear is on board, sir," an orderly reported. "Good luck, sir!"

Cobber settled himself in the cockpit, nodded to the mechanic and ran through a routine engine test. Then gradually a mischievous grin spread over the young giant's face. A few yards away stood his old Hurricane fighter. He uncurled his long legs from the cockpit of the Magister, walked over to the single-seater and wedged himself in.

"One more beat-up, me lads," he said, and before anyone could protest, he took off for one last air fling. Three minutes later he was dead. As the Hurricane made slow rolls over the field, it failed to complete the third one, and its port wing just touched the ground.

The mechanic climbed into the cockpit of the Magister and switched off the engine.

Cobber Kain was a New Zealand lad who had volunteered to fly in the R.A.F. some months before the war started. His home was in Auckland, and he had been wild about flying since he was sixteen. His parents tried to make a scholar of him, but finally gave up and scraped together his fare to England. The day after his ship docked in London he tore into the Air Ministry to sign up, but he failed his medical examination as he was much too large for his age—nineteen—and had outgrown his strength.

"Come back in a couple of months," the recruiting officer suggested.

In two months Cobber had rested up and eaten his way into shape, and became Cadet Edgar James Kain. He studied and practiced for two years and finally was made a fighter pilot in Number 73 Squadron. He was the most untidy flier in the R.A.F. He usually needed a haircut, his uniform was always unpressed and often in need of patching. In the spit-and-polish days before the war, there wasn't much hope for Pilot Officer Kain.

By November 20, 1939, he was strewing German aircraft all over the western front. The press correspondents immediately saw great prospects in this lad, and filed stories on him almost daily. The R.A.F. refused to allow the use of individual names, not even a nickname, and by the time Cobber had shot down seven or eight enemy aircraft, he was still referred to as "a young New Zealand airman." The French press treated Cobber in a more realistic manner and he became France's first air hero. Whenever he slipped into Paris for a few hours leave and a bath, he was mobbed in the Champs Elysées, or in the theater lobbies.

One day a typical action was engaged in by Kain when, on a routine patrol with two Hurricane pals, he ran into twelve Messerschmitts.

"Let's get cracking, chaps. Make for the middle of 'em," he cried into his radio mike, and flamed one enemy ship in the first fifty seconds.

When one of his chums was knocked out of the fight and had to force-land, Cobber noticed that his other patrol pal was being hard pressed by five Messerschmitts directly above him.

Pulling a tight rocket loop, he came up underneath the Me 109s with his eight guns blazing. One enemy fell in flames, narrowly missing Cobber as he plowed through their formation. Next, he found himself sandwiched between two 109s, one in front of his prop, the other on his tail. Air-cannon slugs and bullets whistled all around him, at which time he discovered that he had used all his ammunition. Did he lower his wheels in the token of surrender? Not the Cobber. The other Hurricane pilot he had rescued, knocked the Me 109 off his tail just as an enemy shell broke up his engine. The New Zealander's Hurricane burst into flames, and shouting profanities into his radio, Cobber made a wild try to ram the 109 ahead of him, but with a junked engine he couldn't raise the speed to catch it.

They were now at 20,000 feet, and, choked with smoke, Cobber reluctantly nosed down. The flames roared louder and he knew it was time to bail out. As he pulled back the canopy he suddenly remembered that he had not taken the time to buckle his parachute harness properly when he took off. He dropped back into his seat again and saw that his wild nose dive had at least doused the flames, although oil and smoke still poured into the cockpit.

Then, surprisingly, the battered engine began to tick over again, and instead of looking for a place to crash, Cobber decided to try for a place to land. He made it back to the fringe of the Metz flying field and put down the damaged Hurricane safely. When he climbed out, he fell flat on his face. "Passed out, just like a sissy boy," he grumbled later.

Fearing he was badly hurt, the French officials put him in a hospital. Everyone back at Number 73 waited to hear the worst. When they last saw Cobber he was going down in flames, but two hours later he called up screaming for the squadron medical officer. "Come and get me out! These big-hearted frogs think I'm dying. They've taken away my clothes and won't let me sit up. For Pete's sake, come and get me out!"

Cobber was almost court-martialed for not properly adjusting his parachute, but his pals swore the snaps had become "unhooked somehow."

In a scrap that occurred on March 26, Kain engaged a number of enemy aircraft in the Luxembourg corner. Again he was accom-

panied by two other Hurricane pilots, and as he turned into the formation that had started to climb, he put a burst into the leader who rolled over and spun away in flames. He then noted five Me 109s working to get around him, so he turned hard right and pulled a bead on the nearest German fighter. He fired one burst until the 109 dived away, and then he sent three deflection shots at another. After getting into position on its tail, Kain also sent this 109 spinning into the ground.

As Cobber moved to get a clearer view of the general situation, two air-cannon slugs hit his Hurricane—one went through the cockpit, the other punctured his gravity tank. The explosion on the panel of the cockpit knocked him unconscious and he went into a steep dive. When he recovered somewhat, he worked to ease out of the dive and tried to turn off the fuel pet cock, but the flames seared his face. He turned toward friendly territory and stayed with the blazing hulk as long as possible, but finally had to abandon his aircraft.

"I got out the port side," he explained, "and pulled my rip cord at about 12,000 feet. I came out of the clouds at 10,000 feet and it was all so very still, I thought I must be in heaven. Believing I was now near the frontier, I started slipping the air to get down quickly. I landed at Ritzing, near a wood, and gathered in my parachute and scrambled toward the trees where I hid it. Heading in a southerly direction I encountered a French captain who challenged me at the point of a pistol and inquired about my nationality, after which we both set off for Evendorff. The Frenchman explained that I had landed in no man's land. I received some medical attention and was sent back to Rouvres in a staff car."

When Cobber reached his squadron he was in a wretched state; his trousers and tunic were in tatters, and the squadron medical officer extracted twenty-one pieces of shrapnel from his leg. That night the sergeants gave a binge for the officers and Cobber turned up—on a stretcher.

When he had sufficiently recovered he was granted ten days' leave which he spent in London, and while there was formally awarded the Distinguished Flying Cross—the first British airman then serving in France to be so honored. He also went to the Air Ministry during his leave to explain that he was worried about the publicity he had

been receiving, and to suggest that in fairness to his fellow airmen, he should be transferred to another squadron. The Air Ministry decided that the gesture was well meant, but unnecessary. Kain also became engaged to a British girl during his leave, and she played a large part in his subsequent behavior.

Back at 73 Squadron again his score increased past the even dozen. He was given the D.S.O. and he responded to this honor by having his hair cut, buying a new uniform and living to a new pattern. He looked the air hero and enacted the part to the full. Day after day he was in the air, and regardless of the odds, usually added to his score with threes and fours. At night he took his turn with the NCOs patrolling the airfield when it was rumored that the Germans planned to wipe out Number 73 Squadron with a full force of paratroopers, since they hadn't been able to do it with Me 109s. The pilots who had been helling around in the air all day now had to sit up all night with rifles and bayonets.

This was the period of the Phony War.

One night, when it was hinted that Cobber Kain was due for a Home Establishment job to give him a rest, he sidled up to the British newspaperman, Noel Monks, and confided: "Don't put it in the paper—but I'm getting married next week when I go back. That is, I will, if I'm alive."

A week later, to the day, Cobber Kain was dead.

One of the first Victoria Crosses won in the early Air Striking Force operations went to a young air gunner, Sergeant John Hannah. He was only eighteen years old when he was decorated with Great Britain's highest military honor and it should have brought the impetus to a glorious career; instead he became the principal in a most unsavory and tawdry publicity situation.

Before the war John Hannah was a clerk in a Glasgow shoe store; a slight, cheery chap from the back streets of that murky city. He wore a peaked smile most of the time and people who remember him in those days would scarcely have selected him for any outstanding physical effort that would be comparable to the deeds associated with the blood-red ribbon of the V.C.

How or why he joined the R.A.F. has never been explained; or why he became an air gunner when he might have better served as a

mechanic or instrument specialist. But when the First Air Striking Force went to France, young Hannah was a gunner on a Handley Page Hampden in a squadron that ran up a remarkable record.

The Hampden was a medium bomber powered by two 1000 hp Pegasus radial engines, and early in the war it filled in either as a medium bomber or a torpedo bomber. It had a top speed of 254 mph and was very popular with the men who flew it.

On the day in question Hannah was flying with a Canadian pilot, known only as Pilot Officer Connor, and they were part of a Hampden formation detailed to attack one of the Belgian coastal ports then held by the Germans. During this operation a large explosive shell scored a direct hit on the Hampden and started a dangerous fire in the main bomb compartment; the incoming shell had opened a wide gash in the fuselage of the bomber and a wild blast of air tore through this opening and turned the fire into a blowtorch. In such circumstances the dural framework of an aircraft soon melts and disintegrates.

When the shell first hit, Hannah was in the rear upper turret, but he stayed with his gun until he noted that two other members of the crew had jumped with their parachutes. At this point it was difficult to know what to do, for the youth had no idea whether the pilot was still aboard, or whether he himself was alone in the flaming crate.

Making his way forward, he fought through the flames and found that Pilot Officer Connor was still at the controls.

"You stay there, and I'll see what I can do, sir," Hannah yelled.

"You can't do anything but get the hell out!" Connor yelled back.

"I'll keep her in the air as long as I can, but you better. . . ."

"Give me just a minute, sir."

And with that Hannah looked around the flaming cabin and gradually worked up the idea that if he could stop that damned forced draft he might be able to douse the flame with the airplane's extinguishers. Suiting action to thought, he sacrificed all his chances by pulling the ring of his parachute. The folds of the canopy billowed out from the pack and piled up at his heels. He turned, grabbed up the gossamer bundle and dived headlong through the flames at the gash that was the air-jet of the blowtorch.

How he made it, he could never relate, but by pounding, stuffing and bundling the foaming nylon into the great hole, as the flames

curled up between his legs, he finally stopped the searing draft. Next, he had to wait until the fire ate away all the shroud lines before he could get back again and grab a fire extinguisher.

A blackened, flame-seared specter staggered into the pilot's cockpit and in a scorched-throat voice explained, "I've got it under control, sir. You needn't worry any more. I'll clean up the rest of it while you get rid of the bombs—if that's what you want to do."

Connor waited until he was certain that Hannah had really doused the fire, and then he went on and got rid of his load on the first available target. Young Hannah sat out the raid giving himself first-aid treatment for second-degree burns, and it wasn't until they had landed safely on their own field that Connor had any idea what his gunner had done to put out that fire.

"But . . . didn't you realize that if you hadn't controlled that fire, you would have been in a fine pickle. No parachute!"

"Yes, I think I knew all that, but it wasn't until I stood burning the shroud lines that it really struck me. It was too late then."

John Hannah was awarded the Victoria Cross and Connor the Distinguished Flying Cross. Hannah never flew again; he was in the hospital for weeks and when he came out, there was little that he could do, so he was given a medical discharge.

No sooner was he free of the service than a group of sleazy-minded theatrical men signed him for a tour of the British music halls. He was supposed to wear his uniform with his Victoria Cross and step out on the stage and tell his story—over and over. The British public had never before encountered anything like this, and a furor of outrage went up all over England and Scotland. The Royal Air Force stepped in and pointed out that since Hannah was no longer a member of the service, he could not wear the uniform "except for accepted ceremonial purposes." Without the uniform and the medal, the managers realized the act was worthless and they tore up Hannah's contract.

Young John Hannah, shocked at what he had unwittingly been a part of, fell ill again and never left his bed. He died before the war was finished.

Once Germany indicated that she intended to liven up the Phony War, it was appreciated that no attack on Hitler's communications

could be effective unless it included the coastal traffic, and inland waterways, as well as the roads and railroads. It was generally agreed that the autobahnen were not important since road traffic could never replace railroads and shipping—especially when there was a shortage of gasoline and rubber. A real bottleneck in the German system of waterways was the Dortmund-Ems Canal. It was found to be particularly vulnerable to air attacks at points where there were aqueducts, or where the canal passed through embankments built up on low-lying ground.

The Dortmund-Ems Canal was the only link by water between the Ruhr and eastern Germany, or the North Sea and the Baltic. Iron ore from Sweden went through the canal to the Ruhr on barges that carried millions of tons of freight to and from that industrial district. The canal was attacked several times early in 1940 and the Hampdens of Number 5 Group succeeded in damaging both aqueducts in low-level attacks against heavy flak fire. In one attack to which five Hampdens were assigned, all were severely damaged by gunfire and two were shot down over the target.

The objective of this raid was the vital aqueduct a little north of Munster in Westphalia where the canal spanned a deep valley, and crossed the upper reaches of the Ems. The aqueduct was built over the valley, practically at right angles, and the only feasible method of attack was for the Hampden pilots to fly up or down the natural depression, turn precisely at the right time into the line of the aqueduct, and then release the bombs within a very brief period while flying over this most vulnerable spot of the waterway.

The first wave of Hampdens caught the enemy by surprise; the next was met by a terrific wall of flak fire, but despite this, Flight Lieutenant Roderick A. Learoyd attacked from a height of 150 feet and, although he was blinded by searchlights and his aircraft was repeatedly hit, he successfully bombed his target. So well did he carry out his assignment under the most hazardous conditions, that his government awarded him the Victoria Cross. It was a mystery how he was able to bring his battered aircraft back to his own field, for it literally fell apart when it was put down on the Air Striking Force runway.

It is generally agreed that had responsible officers in the French, Belgian, and Dutch Armies done their duty and blown up a number

of bridges across the Meuse and Mass, it is quite possible that France might have held out much longer, and there might never been a retreat from Dunkirk.

But they were not destroyed, and the Nazis swarmed across, raced from Holland into Belgium, and from Belgium into France. Day after day the cry went out from French headquarters, "The bridges must be blown!" but unfortunately no real orders were given, and in the end—too late to save France—they were blown by the Advanced Air Striking Force of the R.A.F.

On May 11, the day after the Panzer forces charged over the all-important bridges and burst into Sedan, an R.A.F. bomber squadron was ordered to destroy the Maastricht bridge at the junction of the Meuse and the Mass on the Holland-Belgian frontier. The order read: "You are to demolish the bridge at all costs."

Learning that the Germans were using this bridge as their main route into Belgium, the R.A.F. commander knew it would be heavily defended and the raid that was planned to destroy it would be a suicide task. He explained the importance of the mission and asked for six volunteer pilots and their crews. The whole squadron stepped forward. In the end the names of all the pilots were dropped in a hat and six drawn. They flew Fairey Battle bombers, an obsolescent type that was about to be turned back to the training squadrons. The airplane carried a crew of two, and was powered with a 1030 hp engine which gave a speed of 240 mph under a full military load.

A number of Hurricane fighters of Number 1 Squadron were ordered to give some fighter cover and they arrived over the target at 9:12 A.M.—the Fairey Battles were due at 9:15—and in those three minutes was staged one of the epic battles of the Phony War.

While circling the area to await the arrival of the light bombers, the Hurricanes first ran into fifteen Me 109s that were poised some 1000 feet above. They shot down three of the enemy and then were cut off by two more 109 formations, one consisting of forty and the other of fifty Jerry fighters. The British fighter squadron leader looked at his wrist watch and quietly swore. The Battles were due in another minute and the Messerschmitts *had* to be put out of the play.

"Mix it, lads!" he ordered and took his fliers into the thick of the defending fighters.

Although outnumbered by more than twelve to one, the Hurricanes fought ferociously. They had been sent up to clear the way for the bombers, and they did. As the six Battles came in for their first run on the bridge, five more Messerschmitts went hurtling to the ground. The Hurricanes also received heavy punishment.

Squadron Leader Halahan had to bail out when his aircraft caught fire from the impact of a 109 shell. Sergeant Pilot Sofer went staggering off seeking a place to land; his Hurricane was riddled with bullets. He was followed by Flying Officers Brown and Lewis. That left four Hurricanes to provide protection for the Battles, and with Flying Officer Clisby leading, they continued to snarl through the fray until, as if by magic, the sky was suddenly clear—the four Hurricanes circled over the Maastricht bridge, masters of the air. Why the Messerschmitts left was not known—they may have been called away on another mission. At any rate, the way was clear for the six Battle bombers who made their first pass at the all-important structure.

Flying Officer Clisby reported later: "I watched them go down and it gave me goose pimples, seeing them apparently diving down the muzzles of at least one hundred antiaircraft guns."

The Maastricht bridge was destroyed, stone for stone. Swooping down within 50 feet of the ramparts, the Battles planted their bombs squarely where French demolition mines should have been. The bridge collapsed in a hopeless pile and hundreds of Nazi soldiers went down with it. But the Battles paid a terrible price. Two were blown to atoms as they pulled away from dropping their bombs, and of the original six, only one was able to stagger back to its base. The leader of the raid and his sergeant air gunner were awarded the Victoria Cross—but neither returned.

The German air attack on France was divided into five phases. For the first three days, beginning May 10, 1940, it was directed mainly against airfields and emergency landing grounds, railroads, and factories. Eighty-one airfields were plastered, which gives some indication of their respect for Allied air defenses.

During the second phase, which lasted until the German armies

reached the Channel ports, the principal targets were troops and transport, though they made fifty-nine attacks on the airfields and thirty-seven on factories.

The third phase lasted from May 27 to 31, during which time the Germans concentrated—unsuccessfully—on preventing the British Army and the French Northern Army from escaping through Dunkirk.

Throughout the fourth phase, from June 1–4, Goering made raids on communications and factories near Paris, in the district of Lyons, and as far away as Marseilles and other targets in southern France.

In the fifth phase, which lasted until the French asked for an armistice, the Luftwaffe returned to the support of the German armies. The harm done to French industrial life was difficult to estimate, but substantial damage was inflicted on her railroads and ports, and considerable havoc on her major airfields. The German attacks were carried out without regard to casualties and by June 4 it was estimated that the Luftwaffe had lost 2847 aircraft destroyed in the air and on the ground. This figure includes about 400 troop carriers.

By June 16, it was obvious that France was about to sue for an armistice, and the next day she did so. By that time all British bombing forces were being withdrawn from French territory. Nothing more could be achieved by the Advanced Air Striking Force or by the Bomber Command. Both had thrown themselves into the battle, regardless of losses. They had dropped hundreds of tons of bombs on objectives selected by the French High Command. More than a thousand tons had fallen on the railroads of France and northern Germany.

Their casualties were particularly severe. On May 10 the Advanced Air Striking Force had 135 bombers serviceable. During the next five days they lost 75 of them. Between May 10 and June 30 the British Bomber Command lost 40 per cent of its first-line strength.

After the Belgian surrender and the Allied decision to evacuate, the stage was set for the retreat from Dunkirk. Defiantly, the British Army fell back on the one port still in Allied hands. Fierce rear-guard actions by the remaining French units covered their retreat.

Dunkirk is still looked on as a miracle. No one believed the British would get 25 per cent of her forces off, but more than 338,000 men, including French, Dutch, and Belgians, were taken from the bloody

beaches of Dunkirk. Every British airplane was thrown into the fight; London was stripped of its aerial defenses, but control of the air over Dunkirk was wrested from the Germans long enough to accomplish the miracle.

The stage was being set for the first major air war in military annals. On August 20 Prime Minister Winston Churchill, in a grave review on the progress of the war, after referring to the contributions and gallant achievements of the Royal Navy, turned to the grim prospects of the future: "The gratitude of every home in our island, in our Empire, and indeed throughout the world, except in the abodes of the guilty, goes out to British airmen who, undaunted by odds, unwearied in their constant challenge and mortal danger, are turning the tide of world war by their prowess and by their devotion. Never in the field of human conflict was so much owed by so many to so few."

This classic pronouncement which has been repeated so many times, and often garbled, best captions the Battle of Britain.

Mr. Churchill was speaking at a moment when the conflict in the skies was still at its height, for it was not until the end of 1940 that the Luftwaffe virtually abandoned its daylight attacks and turned to a policy of nighttime raiding—a tacit admission of defeat.

Two years later when certain British newspaper commentators questioned the possibility of the U. S. Army Air Force striking at Germany in daylight, American strategists—particularly General Orvil A. Anderson, Deputy Chief of Planning under General James H. Doolittle of the Eighth Air Force—stated emphatically that for the U.S. to abandon its daylight operations would be a virtual admission of defeat, and that precision strategic bombing, so rewarding in its returns, could be carried out only in daylight. Fortunately, the two patterns dovetailed splendidly as the war months proceeded, and the combined bombing plan brought Goering eventually to his just desserts.

Hitler's general idea in forcing the Battle of Britain was to obtain a quick decision and end the war by the autumn or early winter of 1940. Actually, he was well satisfied with his success in continental Europe and couldn't understand why the British persisted in opposing him. He made several vague, round-about bids for a negotiated

peace with the British, but they refused to deal with him. The rest of the free world looked on this attitude with mixed feelings of disbelief and pity. The general view in the United States was that Britain's situation was hopeless and that their island would be invaded with greater ease than was France. "What do they have to fight with?" critics asked. "They lost practically everything they had at Dunkirk."

Unquestionably, Great Britain stood alone. A blustering Mussolini, cheered by Hitler's unbelievable successes, finally raised the courage to declare war on a tottering France in June 1940. His General Rodolfo Graziani had an army of more than 250,000 men on the frontier in Libya, while Britain's General Archibald P. Wavell could muster only one-tenth of such a force to oppose him. By September 13 Graziani began his advance into Egypt and by September 16 had reached Sidi Barrani where he was halted, but no one knew how long he would sit there before he made a second move to get to Alexandria and the Suez Canal.

The spirit of France was crushed. The government, then meeting in the city of Vichy, was debased by collaborationists, and under Pierre Laval, vice premier in the Pétain cabinet, the republic was abolished in favor of a totalitarian regime. The French public was inarticulate, and the order of the ruling politicians was co-operation with their Nazi conquerors.

Russia was demanding the annexation of Bessarabia and northern Bucovina. Rumania was literally torn asunder. In the meantime, Spain became closer knit to the Axis under pressure of the German armies on her northern border, and the future of Britain's base at Gibraltar was in doubt. The economic position of both Germany and Italy was improved by the fall of France and practically all of Europe's Atlantic coastline was by now a huge network of air and submarine bases stretching in an arc about the British Isles. The direct result was a huge increase in British shipping losses. In addition to a German frontal assault, Great Britain faced the prospect of starvation by blockade.

The French collapse also galvanized Japan into action. French Indochina was forced to halt all traffic into Free China and thousands of Japanese officials poured into the French colony to "inspect" the railroads for violations of this agreement. To appease Japan, Britain

closed the Burma Road to all China-bound supplies, but by September 27, 1940, Japan was a full-fledged member of the Axis.

The United States issued a warning to all European powers that the transfer of European colonies in the Western Hemisphere to non-American nations would not be tolerated. In the Near East and in Africa unrest and indecision wracked the still-unconquered French Colonial armies. Late in August 1940, no longer protected by the French forces in neighboring French Somaliland, British Somaliland fell, an easy prey to a powerful Italian invasion.

In the middle of July 1940 Britain's picture was indeed most gloomy. After Dunkirk, fate had saved them when the conquering Germans made the mistake of turning from a beaten Britain to concentrate on a staggering France. Only the R.A.F. and the obstinate courage of the British people saved the British Isles after that.

Three days after Dunkirk, munitions works belched smoke and products. Thousands of Britons rushed to take up anything from an ancient pike to a Sten gun. Home Guards built defenses against parachute troops and seaborne landings. Men and women toiled over machines for sixteen hours a day to equip a new army. Tanks and airplanes rolled from plants, as never before. This was a national miracle. In a few short weeks a new armed force no longer stood bare-handed.

The Germans struck their first major blow on June 19 when one hundred aircraft dropped bombs on key cities. In a short time they used twice that amount, and soon 1000-plane raids were the general order of the day. Strictly speaking, there were no military objectives; every square inch of British soil that could be reached was to be hammered and pounded to rubble.

The German plan had four distinct phases. 1) Systematic bombing of British cities and military objectives to destroy morale and the will to resist invasion. 2) Destruction of the British sea lanes by bombing and submarine attack to shut off Britain from her supplies and reinforcements from America and the Empire. 3) Destruction of the Royal Air Force and all its bases by bombing attack, to allow a combined seaborne and airborne invasion to land on Britain unhindered. 4) After this softening-up, actual invasion by parachute troops, air infantry, and regular army units transported in specially built barges assembled on the French, Dutch, Belgian, and Norwegian coasts. The

plan was never executed—the Royal Air Force refused to be shot out of the skies. Fighting at odds of five and six to one, they waged a most magnificent underdog battle. No military conflict comparable to the Battle of Britain, which brought the highest praise from the Prime Minister, had been fought before.

There were only three actual dogfights in World War I—air battles in which possibly one hundred aircraft mingled and exchanged bursts of gunfire, or crashed head-on in mid-air collisions. But their numbers were infinitesimal when compared to those that were engaged over the fields of Kent and Sussex, the rolling country of Hampshire and Dorset, the flat lands of Essex, the smoky mass of metropolitan London. Moreover, the jousts of 1914–18 had very little effect on the outcome of the war, but the Battle of Britain unquestionably saved the United Kingdom and kept possession of what was to be the free world's air base and jumping-off point for the eventual invasion of Europe.

Paradoxically, while the great battle went on day after day, the men and women of Britain went about their daily tasks with little idea of what was taking place miles above their heads. This battle was not shrouded in the smoke of artillery, with the roar of guns and cascades of erupting earth. Actually, there was little to intrigue the ear, but at times one might read its history in the fantastic chirography of vapor trails, with their slowly changing lines and curves. At broken intervals an angry chatter spat at the duller growl of engines. Between these dramatic exchanges there might come a high-pitched shriek, followed by the crash of heavy bombs as the enemy unloaded his hellish cargo.

Fortunately, the rapier thrusts of "the few," used with brave economy, eventually pierced the hearts of the raiders. It was nothing that could be seen from the ground, and the score could be tallied only by counting the heaps of smoking debris that littered the countryside. Had it not been for these well-timed rapier thrusts, the towns of southern England, even the capital of the Empire itself, might have suffered the fate of Warsaw and Rotterdam.

At this point it might be well to consider the weapons used, and the strategy and tactics involved, for the information can be applied

to later conflict when the issue was carried to the enemy. In the Battle of Britain the Germans sent over five main types of bombers:

- Ju 87, a dive bomber (Stuka)
- Ju 88, bomber, dive bomber, night fighter
- Heinkel 111 bomber-torpedo machine
- Dornier 17 bomber
- Dornier 215 bomber

The Ju 87 was a two-seater dive bomber, low-wing monoplane armed with two machine guns. With whistle-type tubes set to the slip stream when attacking, it presented a frightening aspect and played a large part in the dreadful confusion of refugee civilians in Poland, Holland, Belgium, and France. It had no such effect on the British since it seldom managed to break through the British fighter screen and get near the ground. The Ju 88 was also a dive bomber with a maximum speed of 317 mph. Its crew accommodation and armament were similar to that of the Heinkel 111. This aircraft also was a low-wing all-metal cantilever monoplane with two engines. It carried a crew of four and was armed with three machine guns. Its top speed was about 275 mph.

The Dornier 215 was a high-wing, all-metal monoplane with three machine guns, mounted in much the same manner as on the Heinkel 111, and was a development of the Dornier 17, generally known as the Flying Pencil. Variations in design and increases in armament were constantly made in these machines which bombed Britain during those harrowing weeks of 1940.

The bombers were protected by German fighters of two general types, the Me 109 and the Me 110. The former was a single-seater fighter armed with an air cannon which fired through the air-screw hub, four machine guns in the wings, and two more set in troughs under the engine cowling. At the time the Me 109s maximum speed was more than 350 mph. The Me 110 was a two-seater fighter powered by two engines. It was an all-metal, low-wing monoplane with two fixed air cannon and four fixed machine guns set to fire forward from the nose. It was much larger than the Me 109 but not so maneuverable, and its maximum speed was about 365 mph. In both aircraft the crews were protected by slabs of armor plate, the size and shape of which became standardized during the campaign. The Ger-

mans also used a few Heinkel 113s which were low-wing monoplanes powered with a single engine. An air cannon fired through the propeller hub and there were two large-bore machine guns in the wings.

To combat this array of fighters and bombers, which Goering and many other people had claimed were superior to any British aircraft, the Royal Air Force fought with the Spitfire, the Hurricane, and, occasionally, the Boulton and Paul Defiant. The Spitfire Mark I was a single-seater fighter with a Rolls-Royce Merlin engine, a low-wing all-metal aircraft with eight Browning machine guns set in the wings outside of the arc of the propeller. It had a maximum speed of 368 mph. The Hawker Hurricane Mark I also was a single-seater, similarly armed and powered, with a maximum speed of 335 mph. The Defiant was a two-seater fighter with a Rolls-Royce engine that could have been used to better effect, had its potential been thoroughly studied. It was fast, maneuverable, had a good range of action, and the rear gunner had four Browning machine guns set in a power-operated turret.

All of these machines went through various modifications as the months went by. Their speed was increased, armament was improved, and some were redesigned for more detailed missions. To present full details of all these types would require a volume in itself, and add little interest for the reader. It should be assumed that, as the actions are described, the aircraft involved are generally those that were produced at the time.

It is now known that Goering had enough bombers to destroy the important cities and military points in Britain. They had the range, when the coasts of Holland, Belgium, and France were free to them, but his fighters did not have the fuel to escort the bombers to most of the important areas, and it was on this premise that Britain based her air defense. It was obvious that to have her limited fleet of available fighters waste their time and numbers against enemy fighters would be poor arithmetic. The R.A.F. Fighter Command pilots were ordered to avoid as much as possible any wasteful action against the German Messerschmitts and to concentrate on the bomb carriers to halt them or prevent them from bombing important targets with any degree of accuracy.

The governing principle, so far as the British defense was con-

cerned, was that a sufficient strength of fighters had to be assembled at the required altitude where it could intercept the oncoming enemy raid and break it up before it could reach its objective. To use standing patrols was impracticable and wasteful, and to keep a sufficient number of fighters continually in the air would be beyond the power of the largest air force imaginable. The fighter force was kept on the ground, and ordered into the air only when raids appeared imminent.

Information concerning the approach of enemy raiders was obtained in various ways and was passed to Operations rooms. In 1940 Great Britain was well ahead of the Germans in the science of radar detection, a factor that perhaps played a greater part in the renowned air battle than has been realized. The information was co-ordinated and distributed to the fighter squadrons by an area controller.

The role of the fighter pilot in World War II has seldom been fully appreciated or understood. At the time of his service he was usually considered in the same light as his counterpart of a quarter of a century before; a continuation of the "ace" performance, the gay, raunchy, devil-may-care standards of the intrepid birdmen who flew when the spirit guided and gilded the horizon with his flaming victories.

The single-seater pilot of 1939-45 was, generally speaking, a new breed, solemn, sometimes dour, most difficult to know and sparing with his words and thoughts. The "ace" of the Great War in most cases, was a refugee from some famous spit-and-polish regiment who admittedly had transferred to evade the discipline, the hoary traditions, the desolate duty of stalemated warfare. Old-line cavalry regiments, totally immobile in that era of trench operations, lost hundreds of dashing subalterns and troopers to the new aviation services. Not only could they renounce the hobbling strictures of garrison life, but in the infant flying services they found a new freedom of action, behavior, thought, and expression. Flying was the latest military fashion, giving thousands of young men a new outlet for all their wartime enthusiasms. They may not have provided the most efficient air arm, but they did put new life into a dreary campaign, and their like we shall never know again.

The fighter pilot of World War II had no such freedom. He had selected and entered the aviation service during the middle 1930s

and by then the disciplinarians had restored all the spit-and-polish, military dogma, and poker-backed rule books. The United States Army still had control of the Air Corps and in Europe old-time military drill sergeants exerted much influence in the development of the air services. Thus, they were no longer the relaxed, ragtime outfits of 1914-18. Military decorum, strict rules and old-time garrison behavior were an integral part of the new airman's training in the cadet schools.

This new discipline was necessary since the equipment these young men were to master had progressed in great swoops from the primitive aircraft flown in World War I. Not only had the horsepower of the engines been increased enormously, but the ancillary equipment had been improved to new technical heights. The \$1500 light airplane of 1939 was more intricate in its power plant, controls, and instrumentation than any fighter of 1918.

The new fighter pilot's duties involved longer ranges which demanded a higher standard of navigation. The tankage, spread through the various sections of the air frame, provided a myriad of valves, pet cocks, and fuel lines that would have baffled the average World War I pilot. The radio sets, unknown in 1918, required weeks of intensive training to master and operate. Gunnery, using six or eight .50-caliber weapons, was controlled by intricate gun sights, and the accepted pattern of fire against varied targets, was knowledge that no World War I pilot could have conceived.

The World War II fighter aircraft was a problem in itself, capable of terrific speeds, ranges, and altitudes. The pilot had to be physically adjusted to the violent variances of direction that were experienced in aerobatics or routine evasive tactics. He had to know how to fly tight formations for long periods of time, a task that drained the vitality from the strongest man. He had to make instant decisions, particularly in the identification of enemy or friendly aircraft. On any day of his wartime service a mistake might cost him his life.

A composite picture of the 1939-45 fighter pilot would encompass the catalogue of the modern military man. He had lived on this earth between twenty and twenty-five years, and, including his college education, had spent about six years in training for his profession. Because of his individual role he was considered the knightly member of the air service, but he had no illusions about himself.

His task was to defend his bombers, or his own cities from enemy bombers. At times, if he carried certain weapons, he attacked the enemy on the ground, but most of his battles were fought high in the sky. He defended, but his defense was not the passive, Maginot line type; he charged at his enemies with the impact of one thousand horsepower in the palm of his hand. All his attacks were aerial bayonet charges, and if he struck clean, he was lucky. If he missed, his opponent was awarded the next thrust. A bayonet charge at five hundred feet per second demanded eyesight, reaction, and timing, the like of which no sleek bullfighter ever displayed.

Under these conditions, death moved as fast as the combined speed of his own and the enemy machine. The fighter pilot of World War II had to think in brackets of split seconds, and once he left the ground, he had to discard his earthly feelings and the complexes of hate, patriotism, and comradeship, and devote his efforts to *esprit de corps*—teamwork—the true instinct of life.

His physical existence was reflected in the dozens of dials in his cockpit, and the only object in his life was to destroy the enemy plane, or attack the mission's ground target. During these wild maneuvers, fantastic reactions followed one after another. Some biological process took place, much of it symbolic. The safety belt and shoulder straps held him firm inside the small compartment which was molded around him like the skull which shelters the brain, and as such, the pilot was the brain of his war bird.

This fusion of man and machine is clearly sensed the instant the guns start firing. Fighter pilots agree that not only eye and hand carry out this sequence, but every part of the man is involved. All sinews of the finely trained pilot go into guiding the aircraft and firing the fixed guns. Symbolism continues as the bullets screech from the wing ports and become the fangs and claws of a falcon mauling its prey. The combination of speed and firepower is the pilot's expression of the will to conquer.

No race or geographical group has a monopoly on fighter-pilot skill. The true fighter pilot is born with the qualities of the old-time lancer, and is gifted with the lancer's temperament and dash. The World War II single-seater pilot displayed these characteristics four miles high in the sky, riding not one, but one thousand horses. He was a new character in the glorious company of military heroes.

From the German point of view, Goering had no heavy strategic bombers, although General Walter Wever, the first Luftwaffe Chief of Staff, had demanded them for years. His requests in 1938 had resulted in a number of splendid aircraft and although he had pinned his hopes on the He 177, a machine in which four engines set in tandem drove two four-bladed props, this combination had many technical faults which delayed mass production for about three years. The ones that were turned out, were seized by Admiral Karl Doenitz to give long-range protection to his U-boats. As a result, the Luftwaffe went into the Battle of Britain with a fleet of twin-engined medium range bombers, and two types of fighters of limited range.

The German Air Force had to accept the fact that any offensive against Britain could be directed only against a small and extraordinarily well-defended sector of the British Isles. But this sector included London, the heart of the British Empire, a city of 7,000,000 people and of great military importance since it was the brain and nerve center of the British High Command. It was also an immense port, and a depot for armament and munitions distribution. The fact that London was within range of day bombing attacks with fighter cover, however inefficient, must be regarded as one of the positive factors of the German offensive.

According to Adolf Galland, one-time commander of the Luftwaffe Fighter Arm, Germany had but 2500 air force machines available to put against Britain in the summer of 1940, whereas Britain was believed to have 3600 first-line war aircraft, of which only 600 were fighters. He boasts that the Me 109 was the finest fighter in any air force, and had been accepted as the pioneer and prototype for international fighter construction. He ignores the fact that the Spitfire was a natural development of the 1931 Supermarine S.6B which had won the Schneider Trophy for Great Britain, and went on to raise the world air speed record to 406.99 mph, nearly 50 mph faster than the record set two years earlier by its immediate predecessor, the S.6. The original Me 109, then known as Bf 109 was not conceived until the summer of 1934 when the German Air Ministry issued a requirement for a single-seater interceptor fighter monoplane with which to replace the obsolescent Heinkel He 51, and the old Arado Ar 68 biplanes then serving as Luftwaffe fighter elements.

Galland insists that the Spitfires were 10 to 15 mph slower than

the German fighters, but could perform steeper and tighter turns, and the older Hawker Hurricane "compared badly with our Me 109 as regards speed and rate of climb." Whether, as he says, German armament and ammunition were better, might be a matter of opinion, but his contention that Nazi fighter aircraft were equipped with fuel-injection pumps instead of carburetors and were not likely to conk out through lack of acceleration in critical moments during combat, has some merit. He admits freely that when British fighters got into trouble they simply outmaneuvered the Germans with smart half-rolls or half-rolls pulled at the top of a loop.

In the first stage of the offensive the Germans sent over massed formations of bombers, escorted by similar formations of single- and twin-engined fighters. The escort airplanes flew in large, unwieldy patterns, from 5000 to 10,000 feet above the bombers. They could only reach the English coast, after half an hour of flying, and with a fuel range of eighty minutes, had but twenty minutes of fighting action a short distance inside the limits of the British Isles.

Twenty-six such attacks, most of which were directed at various phases of British shipping, were made during the first stage of Goering's program. This was probably regarded as the most vulnerable form of target and the easiest to attack, since slow-moving ships are difficult to defend and the casualties among the pilots of the defense are always higher when the action is fought over water.

Through the early part of August, convoys were fiercely attacked and some ships were sunk. Seaport towns such as Portland and Weymouth were also hit, but the attackers lost heavily since Goering used the slower dive bombers which were battered to rubble by the tough, fast-diving Hurricanes. It was during this period that Flight Lieutenant James Brindley Nicolson of Number 249 (Hurricane) Squadron won the Victoria Cross for valor in the face of the enemy. He was the first fighter pilot of World War II to gain this high award.

Nicolson had joined the R.A.F. in 1936 and was possibly one of the tallest pilots in the service. He stood six feet four inches. Late one afternoon he met a number of Me 110s in the vicinity of Southampton, which was the first time in about a year of aerial warfare that he had been close enough to an enemy aircraft to justify warming his guns. He tore into action with gusto and picked out his man. Another Me 110 poured four air-cannon shells into his Hurricane,

making a frightening clatter; one hit the reserve fuel tank and started a fire, another crashed into the cockpit and tore away part of his trouser leg, the third hacked out a bad wound in his left heel, and a large metal splinter burst through the cockpit canopy and almost severed his left eyelid.

Although half-blinded, Nicolson reacted fast and carried out the necessary evasive action. Then he remembered that he had started to fight a Nazi aircraft and that it had overshot him. The sight of that plane with the swastika on the tail fin filled him with black hate. The pain of his eye and wounded foot was agonizing and both hands were gradually roasting from the terrific heat in the burning cockpit, but he was determined that that Nazi would not get away. Calling on the last dregs of his courage he finally got the Me 110 in his sights and pressed the fire button on the circular control grip—the eight Browning guns backed up his valor.

He never really knew what happened, but eyewitnesses saw the Messerschmitt crash into the sea. Badly injured as he was, he somehow managed to jump from the burning hulk. His hands were so severely burned, he fell several thousand feet before he could yank the rip cord. As he floated down a Nazi airplane flew past him, so he hung limp in the harness to give the impression he was dead, and the German pilot did not bother to shoot at him. As he dropped lower and lower he noticed that blood was throbbing from the lace holes in his shoes, and when he hit the water, his hands could not pull away the heavy oxygen mask.

The young R.A.F. pilot was picked up out of the sea, cut out of his 'chute harness and rushed to a hospital. For two days he was not expected to live, but his youthful vitality pulled him through. His burned hands were ugly claws, but after weeks of delicate operations he could again grip a control lever and throttle and was soon flying.

It was during this harrowing period that Flight Lieutenant Richard Hillary, who became known for his book *The Last Enemy*, was shot down and horribly burned. His dramatic adventure, crack-up, and long period of surgical operations form one of the great stories of World War II.

After his fighter had been set afire when he was beyond the coast of Kent, Hillary was trapped in the blazing cockpit and had much difficulty ripping open his canopy and escaping from the burning

ship. After a terrible ordeal, he managed to struggle free and bail out. He was rescued from the sea by a lifeboat, but his face and hands were pitifully burned. He, too, appeared to have no chance to live, but after many painful, but skillful operations, he eventually returned to flying and received additional training in a Night Fighter School. Then, on January 7, 1943, his plane crashed while landing at an airfield near Berwick and he was killed.

Richard Hope Hillary was born in Australia in 1919, but when still a child he was taken to England by his father who had been secretary to the Australian Prime Minister. In England, Richard was sent to Shrewsbury School, and from the age of thirteen on spent many of his school vacations on the Continent by himself. He was at Trinity College, Oxford, when the war broke out, and as a member of the University Air Squadron was quickly taken into the R.A.F. and made a Spitfire pilot.

Hillary's book, which was written while he was recovering from his frightful burns, brought him sudden fame that disquieted him. He had not wished for personal acclaim, but he had written it so beautifully, and with such rare detachment and lack of sentiment, that it was certain to become an aviation classic.

Wing Commander A. C. "Sailor" Malan of Number 74 Squadron began his amazing fighter history during the Battle of Britain. At the time he was a squadron leader and the 74th was stationed at Manston, one of the several airfields the Germans were trying to obliterate. Malan led a full squadron for the first time on August 11, and on that day they accounted for thirteen Me 109s and ten Me 110s destroyed, one Me 110 "probable," and fourteen others damaged. These telling victories were accumulated during four skillful interceptions between the hours of 7:45 A.M. and 2 P.M.

The number of bullet holes in the wings of the Spitfires was a visible indication of the intensity of the fighting. Malan's combat report gives authentic feeling to one incident of this amazing day.

"I was Dysoe"—code name—"leader when the squadron was sent off to intercept bandits approaching Dover at a reported height of 13,000 feet. I climbed on an ENE course to 20,000 feet into the sun and then turned downsun toward Dover and surprised eight ME 109s flying in pairs, and in staggered line-astern toward Dover.

"I ordered the squadron to attack. Some of the 109s adopted the

usual German evasive tactics, i.e., quick half-roll and dive. On this occasion, as the air seemed clear of German aircraft above us, I followed one down and overtook him after he had dived 2000 feet, opening fire during the dive at 200 yards range with deflection. He leveled out at about 12,000 feet when I gave him two two-second bursts at 100 yards range. He was in a quick half-roll and dived toward the French coast. I closed again to 100 yards and gave him three more two-second bursts. He suddenly burst into flames and was obscured by heavy smoke. This was at 4000 feet, one mile NW of Cape Griz-Nez. I did not watch him go in, but flew back as fast as I could. I did not see the engagements of the rest of the squadron.

"N.B.—Normally, I have strongly advised all pilots in the squadron not to follow 109s on the half-roll and dive, because in most instances we are outnumbered, and generally at least one layer of enemy fighters is some thousands of feet above. It was found that even at high altitudes there was no difficulty in overtaking enemy aircraft on diving, apart from the physical strain imposed on the body when pulling out."

The second squadron patrol intercepted the enemy as they approached Dover at about 10 A.M. Several elements of six Messerschmitts could be seen stooging around over the Channel, so Malan led his twelve Spits in their direction. Pilot Officer Freeborn and Warrant Officer Mayne made up Malan's section. Malan and Freeborn each destroyed one enemy and Mayne damaged two more.

"I intercepted two Me 109s," Malan recorded later, "and dived on their tails. I delivered two two-second bursts at 150 yards, but as I was overshooting I cleared off and the remainder of the section continued the attack. I immediately climbed back where my Blue and Green sections were waiting above, and tried to attract their attention but my radio set was out and I could not get them to form up on me.

"I proceeded toward Dover by myself and attacked two Me 109s at 25,000 feet about mid-Channel, delivered two two-second bursts with deflection at the rearmost and saw my bullets entering the fuselage. He immediately flicked off to the left, and I delivered two long bursts at the leader. He poured out quite a quantity of white vapor. At this, eight Me 109s which had escaped my attention, dived toward me, and I climbed in a right-hand spiral, but they made no

attempt to follow. I proceeded toward Dover on the climb and spotted ten Me 109s at 27,000 flying in line-astern with one straggler. I tried to pick this one off but was unable to close the range without being turned on by the leader of the formation. I circled in a wide sweep with them for ten minutes while I tried to notify the remainder of the squadron by radio. This proved to be impossible, so I gave up and returned to Manston."

Malan's Spitfire was not serviceable for the third tallyho of the day and his squadron was led by Freeborn. They had been ordered to patrol a convoy some 12 miles east of Clacton-on-Sea where they came upon about forty Me 110s. As the Nazi pilots screamed, "*Achtung! Spitfire!*" and went into their defensive circle, Freeborn took his element smack into the middle. In the next few minutes ten Messerschmitts were destroyed and five damaged. Two pilots were lost, Flying Officers Smith and Cobden.

On the fourth patrol of this astounding day, Sailor Malan led eight Spitfires over Folkestone, turned off for Margate and sighted ten Ju 87s at 6000 feet and twenty Me 109s at 10,000 feet. Malan, Freeborn, Mungo-Park, and Stephen pounced on the 109s which were diving through the clouds through which the Stukas had gone. A few telling bursts caused three German pilots to take to their parachutes. They floated down into the Channel, and Sailor gave the required information to the Sea-Air Rescue forces. One of these pilots was found and as the British airman aboard the cockleshell tried to help him into the craft, the arrogant captive spat at him. There is no reliable record of what the Britisher did—once he had the Nazi on board.

Malan's report in part stated: "We climbed through 10/10ths cloud with eight machines in two sections of four. On emerging I spotted about thirty Ju 87s in long lines of small V-formation; about fifteen Me 109s about 2000 feet above and half a mile astern. On sighting us the bombers dived toward a gap in the clouds while the 109s closed their range with the Stukas.

"I ordered Freeborn's Blue Section to take on the bombers while I attacked the fighters with Red Section. I closed the range with the fighters and attacked an Me 109 as he dived through a gap. I opened up at 30 degrees deflection at 200 yards and closed to 100 yards dead

astern. After the third two-second squirt, he burst into flames and went into the sea somewhere off Margate.

"I immediately climbed toward the cloud and then dived into another group of four Me 109s and delivered 30-degree deflection bursts of about three seconds at about 200 yards. I saw no results."

These self-told tales reflect the action and problems of those days. The everyday vocabulary, nomenclature, and patter of these men make interesting reading. Let us consider the experiences of Pilot Officer H. M. Stephen who, during this fantastic day of defense action, was credited with five enemy aircraft destroyed, and three seriously damaged.

Before the war Stephen had been employed in the advertising department of the London *Evening Standard*, and in his spare time trained as a sergeant pilot in the Royal Air Force Volunteer Reserve. At the end of this day in question, Stephen related: "In that first fight over the Channel, there were so many targets, that I was just having bang after bang. I gave one blighter a bang up his tail and he fell into the Channel. Then I had the formation leader with a short burst from close up. He exploded in mid-air—a shattering sight. After joining with two Me 109s climbing into the sun, I gave the nearest to me a two-second burst and particles flew off his bus. He turned over and dived Channel-wards. Later I got another Nazi damaged.

"After breakfast the stand-by order was received. The pilots sat in their machines, belts tight and with oxygen masks, all ready for a quick take-off. Before long we were in the air. Malan led his section into a scrap and they destroyed one and damaged four. My section, led by Mungo-Park, did not receive any special instructions because Malan's radio had stopped a bullet and we couldn't hear anything from him.

"The third flight was a smasher and developed into a hell of a dogfight. We found forty Me 110s in three groups, getting into position to attack a convoy. When the leader saw us approaching, he went into a Nazi defensive circle. This suited us. Mungo-Park carried out Sailor's diving-in-and-out-of-the-circle tactics. Nazis went tumbling into the Channel, one after another. Ten went in for certain, and probably another six.

"My first Nazi in this foray went down in flames after a long burst. Then another Nazi pilot and I had a somewhat prolonged fight. Eventually, a short burst put his gunner out of action. I was now able to get close to the enemy, and after a short burst the Me 110 went down out of control into the Channel. I next finished up my ammunition on another machine. I think I hit him.

"In the fourth flight Malan again led us. He picked up a Nazi raid to the northeast of Margate. Here we saw ten Ju 87s diving through the clouds at 6000 feet and about twenty Me 109s 4000 feet above them. Malan attacked the fighters who dived for the clouds. The bombers had made for home.

"I picked up a straggler and we waltzed around one another for a short time. Then, after a burst, I saw he was losing speed. He foolishly dived away. I went after him, firing short bursts. Suddenly I saw the pilot get out of this 109 and jump. His parachute failed to open and he fell into the water with a splash. I saw one or two other Nazis swimming around. The Me 109 from which my victim had jumped, burst into flames on crashing and ominous black smoke curled upwards."

It will be seen that, unquestionably, British defense during these days profited by the limited range of the German fighters. In effect the actual battle sector represented about only one-tenth of the total area of Great Britain. In the remaining area the British could manufacture aircraft, train pilots, form new squadrons, and build up reserves with little interference. These forces could then be sent into the very limited fighting sector, mainly around London. The British situation was saved by the concentration of all resources and the immediate replacement of losses. These efforts might have been to no avail, had the whole island been the battlefield, instead of the very restricted area.

Had the Nazis had a long-range bomber at the time they could have carried the air war to the north, northwest, and west coasts, and thus materially have hampered the process of replenishing the harried R.A.F.

The assembly of the German bombers and fighters took place at a predetermined altitude and time over a landmark on the coast in the vicinity of their fighter bases. All too often the bombers were

late and the fighters sometimes joined another bomber formation which had already met its fighter escort and thus those bombers proceeded to Britain doubly protected. The belated formation had either to turn back, or make an unescorted raid which usually resulted in their losing many ships.

The Germans had no radio or radar guidance for such an assembly and their difficulties increased with the worsening of the weather in the late autumn. As pointed out, all formations had to take the shortest route to the target area around London since their fighters had very small reserve for combat time. Large-scale decoy maneuvers or any circumnavigation of the British antiaircraft zone were impossible. The antiaircraft barrage around London was strong and accurate and hampered the bombers in the target approach; the balloon barrage over and around the capital made low-level attacks and dive-bombing impossible. Also, the British sent up the bulk of their fighters to intercept the raiders just before they reached their target, and although they did not always prevent the bombers from arriving at their goal, they did inflict heavy losses on them and on the German escort fighters.

Adolf Galland who headed the German Fighter Command at this time has explained that any encounter with British fighters over Britain called for a maximum effort. One day when he was returning from the London area he spotted a flight of twelve Hurricanes north of Rochester. He attacked from 2500 feet above and behind them, hissing like an arrow between the flight. From what might be considered ramming distance, he fired on one aircraft in the rear line of the formation, which tore large pieces of metal from the fuselage. He zoomed at the last minute and leaped over the wounded Hurricane and found himself in the center of the British element. He admits it was not a pleasant experience, but he triggered his air cannon again and escaped from the flight and saw two parachutes open below the formation.

In another encounter west of Dungeness he set a Hurricane on fire, but it did not nose down and crash; it glided down in a series of gentle curves. Galland and his flight attacked three more times, without result. Somewhat puzzled, Galland flew alongside the flying wreck which was completely riddled and pouring smoke. When he

had closed to a distance of a few yards he saw the dead pilot sitting in his shattered cockpit while the aircraft slowly spiraled to the ground as though piloted by a friendly hand.

During a single sortie Galland's wing lost twelve fighter planes—not by enemy action—but because, after flying for two hours, the bombers they were escorting had not yet reached the mainland on the return journey. Five fighters pancaked on the French shore with their last whiff of fuel, and seven dropped into the Channel.

On September 24, Galland made his fortieth kill while flying over the Thames Estuary. Much of this score had been run up against Polish, French, and Dutch aircraft, and some Army Co-operation planes of the British Air Striking force that had worked with the French behind the Maginot line. Galland was awarded the oak leaves to his Knight's Cross for this latest victory and ordered to report to Hitler personally.

Galland says that during this interview he expressed great admiration for the British and was embittered by the insidious and false representations in the German press and over the radio which referred to the R.A.F. in a condescending and presumptuous tone. He expected Hitler to go into one of his rages, but on the contrary, he nodded and said that Galland's descriptions confirmed his beliefs. Apparently Hitler had no desire to continue this life-and-death struggle which he called a world tragedy. He explained that it had been impossible to avoid war despite all his "sincere and desperate attempts." He regretted that he had not managed to bring the British and German people together in spite of a promising start.

Galland then flew from Berlin to East Prussia to see Goering. While he was there more devastating reports came in from the Battle of Britain. The German Second and Third Air Force Groups were suffering even higher losses. Goering, who was furious, could not understand how they continued to lose so many bombers, and demanded to know why the fighter forces did not protect them better.

"Give me an outfit of Spitfires for my squadron," Galland told him, "and I'll show you how to defend our bombers."

Goering was speechless, and finally stamped off, growling as he went.

Few people remember that a sizable force of Czechoslovakian airmen served with the R.A.F. during the Battle of Britain, or recall how they became a part of that organization. When the Germans invaded the remnants of the Czechoslovak State on March 15, 1939, only Czech airmen acted in an aggressive manner during that memorable crisis. Munich had deprived them of their aircraft, but these resolute fliers unhesitatingly put their skill and ability at the disposal of their political leaders and allies, after dramatic and often tragic flight from the humiliation of Hitler's protectorate. Many put aside old recriminations and volunteered to serve with the Polish Air Force, but September 1939 found most Czechoslovak airmen in the tragic position of being forbidden to fly against the Nazis. When Hitler's armed forces swept over Poland, many Czech fliers escaped to Russia, the Balkans and, after journeys that often covered half the world, eventually to France and finally to Great Britain.

In France they were refused admission into the French Air Force, or were only accepted after enlisting in the French Foreign Legion. The few who managed to see action under the French in the closing days of Hitler's blitzkrieg across Western Europe, performed valiantly and destroyed 145 German aircraft. Most of these airmen managed to get to Britain where they were willingly received for duty beside the men of the R.A.F. Number 310 Fighter Squadron was made up with a number of these dedicated Czechs and its history is fairly representative of the gallant contribution made by so many Czechoslovaks who refused to give up.

During the Battle of Britain a large formation of German aircraft was encountered on September 3, and thirty enemy ships were shot down. The Czechoslovak fighters scored their share of this total by destroying six Messerschmitts and one Dornier bomber. By this time this refugee fighter outfit had already downed sixteen enemy aircraft with the loss of only one of their own machines. The raids on London were continuous during this period and the fighter pilots from the airfields in southern and central England flew ungodly hours every day.

One member of the Czechoslovak Squadron, First Lieutenant J. (the refugee fighters did not use their full names in fear that relatives in occupied Europe would suffer retaliatory punishment, and the wartime records have not been revised to include full names) who

had a number of air victories in France and had been awarded the Croix de Guerre and the Legion of Honor, tells in almost classical phrases how one particular fight affected him:

"Once the actual combat starts you don't see much except the roundels or crosses that mark friend or enemy, the white streaks snapping past you which are probably tracers, and then a momentary glimpse of a plane going down in flames, or occasionally a parachute. But in the moments when you are not fighting, it's almost majestic. Great black bombers move in close formation, but little disturbed by antiaircraft fire, and above them, or along with them, formations of fighters. All units seem to be sliding so quietly and calmly through the air—until the fight actually starts. Below, some thousands of feet down, you can see puffs of smoke and dust from bursting bombs, but the air around you seems marvelously clear and quiet.

"You attack out of the sun, and, for a moment, you see nothing but the cross marking your enemy, and the little gleaming bead on your gun sights. Then one of my comrades suddenly is gone from my side, a Messerschmitt after him, and I go after him in turn, to help before it may be too late. And then, quite suddenly, I find myself all alone, all my ammunition gone, with the Thames below me and London a little farther on, almost hidden in a light layer of smoke and mist.

"Another time we were flying in three flights in step formation, a Canadian flight above us and a British flight below. The German bombers were escorted by a considerable number of fighters and it was these we had been ordered to attack. We had a group of Messerschmitts in front of us and I got behind a 110 by maneuvering. The German pilot went into a dive, but not soon enough. I pressed my trigger and put at least 150 rounds into him and saw smoke trickling from his engines. There wasn't time to find out what finally happened, but a comrade flying behind me saw it go out of control and spin into the ground. I believe the pilot took to his parachute."

On September 7 the Czechoslovak Squadron was in combat over the Thames Estuary and during this action four German fighters and one Heinkel bomber were shot down. Sergeant Major Josef K. who had destroyed an Me 109 in this fight, attached himself to a flight of nine Hurricanes and set himself up as their tail guard. Suddenly, his fighter, also a Hurricane, was hit by a cannon shell

from a German Me 110 and in that instant Sergeant Major K. began an unbelievable struggle for life—the fuel tank in front of his cockpit exploded and a great gout of flame enveloped him.

Later on, when his friends were allowed to visit him in the hospital, he gave this account of his experience:

"I lost control of the plane at once, for the explosion had apparently wrecked the controls. She began to nose-dive at a terrific rate. The cockpit cover was open, as I had had it all through the previous fight, so I slipped my safety belt and tried to scramble out. But the position of the aircraft and the pressure of my speed held me in my seat as if I was anchored there. Flames from the burning fuel were roaring all around my head. Never heard such a roaring row in my life. It was just like being in Hell itself, and I gave up all hope. I know now what a man can live through before dying. I thought of my wife and my boy, and quite a lot of other people. Then I summoned up courage to open my eyes in spite of the flames and I could see my own flesh burning on my arms and legs. I was in the most awful pain, but still fully conscious.

"My bust-up had happened at about 20,000 feet, and just as I had given up all hope, fate took a hand—the second fuel tank went up and I was shot out of the aircraft into space. I then realized just how I should have to pay for my foolishness in going into a fight with my cockpit canopy open. The second explosion must have taken place at about 13,000 feet. The remains of my clothing were soaked in gasoline, and I fell through the air like a flaming torch. I didn't dare pull my rip cord, knowing the parachute would catch fire at once and leave me to drop like a stone.

"At last, when my clothes had stopped burning, I pulled the ring about 2000 feet from the ground. The parachute opened faultlessly and in a short time I came down in a garden of a farm on the Isle of Sheppey. My hands were so badly burned, I could not release the parachute harness, and it was only after a long struggle that I could get rid of it. Half-naked and in great pain, I managed to crawl to the main road where I met, and was helped by, a British soldier, and then an ambulance took me to a hospital in Minster. There, a few days later, I was visited by the farmer's wife into whose garden I had fallen. The burned skin over three-quarters of my body

was as hard as leather, and my hands and feet were beginning to curl up from the contraction of the scars."

Josef's friends in his squadron waited week after week, and month after month for the sergeant major to rejoin them. He underwent a series of plastic and surgical grafting operations to his face, arms, and legs which he bore with grim courage. At Christmastime, when his burns were well on the way to healing, Josef announced—although he was so weakened by all his suffering that he could not stand—"I'm glad to say they tell me I'll be fit to fly again soon."

But the air war was not all carnage, sudden death, and destruction. When the action was over, airmen and grounded civilians alike, were able to talk over their adventures, their miraculous escapes, and recall the amusing incidents that crop up in all wars.

During a heavy raid on Plymouth a young newspaperwoman hid her small car in a remote lane while she went to help in the civil defense rescue work. When she returned for it the next morning the vehicle was "missing." She reported the matter to the police. After a week it was discovered standing in an open lot off one of Plymouth's back streets. Careful inquiry disclosed that the automobile had been used by some cadet officers from the Royal Naval Engineering College who had stormed into the city to give any help they could. While participating in the fire fighting and rescue work they commandeered the car and used it throughout the night as an ambulance. When their work was finished they parked the car in the most convenient spot and went back to the college.

The owner's loss had been intensified by the fact that she had left a shoulder of lamb, a bottle of whiskey, and a loaf of bread in the car, but, unbelievably, all the viands were intact when she recovered it a week later. She complained that the meat had "turned" and the bread was stale, but the bottle of whiskey was untouched!

It was around five o'clock one morning when a weary-eyed, heavy-footed and begrimed Auxiliary policeman reached the door of his home. A crowd of men sheltering in the doorway of a nearby building shouted to him: "You can't go in there. There's an unexploded bomb about here somewhere. We heard it come down and we're positive it didn't go off."

"Well, let's find it," the Auxiliary said and the search in the

darkness began. By seniority he was the leader, but he admitted later that his hair "was a bit on end."

At last they found the crater in the garden of a neighboring house. Carefully, the Auxiliary policeman searched the telltale signs with his flashlight. No question, here was the bomb.

Suddenly a female voice came from the doorway: "'Ere! What are you doing in my garden?"

"You've an unexploded bomb here. We've found the crater. You'll have to get out at once," explained the Auxiliary.

"Don't be daft! That's where my old man was digging to make a drain yesterday afternoon," was the ironical reply.

An amusing story went the rounds in Plymouth at the height of the 1940 bombing. It is probably apocryphal, for variations of it were told again during the later buzz-bomb period in 1944.

When the raid was most intense with fires raging everywhere and buildings crashing down in wild confusion of smoke and dust, the police were amazed to see a sailor staggering about the street with a door handle gripped firmly in his fist. His raving against Hitler, and the German Air Force in particular, turned the atmosphere blue. The police finally got hold of him and sought to calm him down.

"Take it easy. Everything's all right," they assured him.

"All right, be damned!" he shouted. "Those bloody 'Uns blew the pub clean out of my hand!"

Friday, August 16, was a particularly good day for the British fighter squadrons and by sunset the fields of Kent were littered with the wreckage of enemy aircraft and most of the villages could boast of at least one Nazi prisoner. Biggin Hill's guardroom had a couple of Luftwaffe airmen in safe keeping. One of them was "borrowed" by the pilots of Number 32 Squadron and taken to their mess for a drink. He was blond, sullen and indignant that he, a *Hauptmann* in the German Air Force, had been placed in charge of a mere British NCO guard. After a few Kentish ales, however, he was more tractable and admitted being a pilot of an Me 110. When one of the British boys tried to spike his beer with a tot of gin, he refused to talk for a while.

After dinner he was taken to the squadron's dispersal hut where he surveyed the disorder of war-weary armchairs, pin-up girls, odd portions of flying kit, and denounced the scene as "most primitive."

"No, it's hardly the Ritz, old boy," someone explained, "but there's a war on, in case you haven't noticed."

That explanation completely baffled the German.

When he noticed Pniak, a Polish pilot, chalking, **MADE IN GERMANY. FINISHED IN ENGLAND** over a display of souvenirs which included machine guns, a fin of a Heinkel, and several other trophies, the guest pilot denied that they were German at all. With that, the fraternal kindnesses were turned off and he was sent back to the guardroom.

A second prisoner, a cheerful gunner, regarded his captivity as merely a temporary misfortune. After several drinks he asked politely for the names and ranks of his hosts. He was most anxious, he explained, to make certain they received equally courteous treatment after Hitler's forthcoming, and inevitably victorious, invasion of Britain.

Canada was to play a major role for the British Empire in World War II, but at the outbreak of hostilities, she had little to offer, except the sincere encouragement of blood brotherhood and the promise to build an air force if and when the Mother Country could supply the necessary aircraft. Canadians could not help much during the Battle of Britain, since economic and shortsighted political considerations had denied them anything that represented the primary factors of air power. Nevertheless, there were hundreds of young Canadians who had made their way to Britain as civilians to join the R.A.F. before the war. It is a startling fact that when hostilities began that September the number of Canadians serving overseas as commissioned officers with the R.A.F. (about 400) was higher than the total number of officers in the Royal Canadian Air Force, including members of the auxiliary squadrons.

Among the eighteen Royal Canadian Air Force officers who were on various duties in Great Britain at the beginning of hostilities was Squadron Leader W. I. Clements, who was assigned to fly a Blenheim with Number 53 Squadron R.A.F. and so become the first member of a Canadian force to fly over enemy territory. Squadron Leader F. M. Gobel, a fighter pilot, scored two air victories over French territory before the British were driven off the Continent.

The first unit of the R.C.A.F. to land in Britain was Number 110

Army Co-operation Squadron headed by Squadron Leader W. D. Van Vliet, but since it was equipped with only ancient Lysander two-seaters, it was assigned very little front-line action. Number 1 Fighter Squadron, commanded by Squadron Leader E. A. McNab, lost three pilots to the defense of Britain that fall. At the same time a complete Canadian squadron, then known as Number 242 R.A.F., was commanded by Squadron Leader Douglas Bader, the famed legless ace. Before the Battle of Britain was ended, forty-seven Canadian airmen had made the great sacrifice in defense of the Homeland.

Number 1 Fighter Squadron was established at the Croydon air base early in July and underwent six weeks of intensive training before being turned loose against the German opposition. This organization was composed of a mixture of very experienced pilots and a few "weekend" candidates from Montreal's Number 115 Auxiliary Squadron. They were provided with Hawker Hurricanes and they also spent some time taking advanced fighter training at Northolt on the other side of London. Squadron Leader McNab drew first blood for the Canadians, when, while attached to an R.A.F. squadron for leader experience, he shot down a Dornier bomber which crashed in the mud flats near Westgate-on-Sea.

On August 17, Number 1 moved from Croydon and was fully established at Northolt and for the next nine days was called out on scramble after scramble, without ever making contact with the enemy. They were shifted to North Weald where, working with a squadron of Spitfires, they had their first real brush with the raiders. McNab led the Hurricanes into a dive attack and destroyed one Dornier, but the German damaged the Hurricane, and McNab was forced to break off and land. In the same scrap Flying Officer R. L. Edwards shot off the tail of an enemy bomber, but was caught in a cross fire from the German turrets and plunged to earth only a short distance from his victim. In the squadron's first engagement, Edwards was the first battle casualty of the R.C.A.F. Before the day was over, however, Flight Lieutenant Gordon McGregor, now head of Trans-Canada Air Lines, destroyed a third Dornier, and four other Canadians were credited with "damaged" planes.

Late in August tragedy struck when a formation of Number 1 Squadron was caught napping, and high-flying Me 109s came out of the sun and shot down three Canadians—all three bailed out

safely. That afternoon they made up for their moment of carelessness. Two Messerschmitts and a Dornier were knocked down into the sea and several more were badly damaged. At the end of its first week of action, Number 1 had participated in four air fights, destroyed eight enemy aircraft and damaged ten more. One pilot had been killed, and seven Hurricanes had been written off.

On September 4, Flight Lieutenant McGregor led a formation that added nine more Nazis to the squadron's score. They continued to fight as a unit in co-operation with the R.A.F. until the close of the daylight attacks. Number 1's final action in the Battle of Britain was on October 5 when, led by Gordon McGregor and accompanied by a Polish squadron, the dual formation met more than thirty German fighters over Maidstone. McGregor, Pitcher, and Christmas all were victors in a melee that was fought from 22,000 down to 15,000 feet. One Canadian was wounded in the action and had to bail out by parachute.

On October 9, Number 1 was relieved of its front-line position and sent to Scotland for a well-earned rest. It had been in action for fifty-three days, and had destroyed thirty enemy raiders. Three of its members had won Britain's D.F.C., three pilots had been killed, and ten wounded.

Between the end of the first stage of the Battle of Britain and the active beginning of the second, there was an interval of five days when the Germans made wide-spread reconnaissance with single aircraft. These snooping operations cost them thirty-nine machines; British losses were ten aircraft, with six of the pilots saved.

In the ten days after the opening of the Battle of Britain attacks, Goering lost 697 aircraft, but the R.A.F. losses for the same period were not light. They lost 153 airplanes; 60 pilots were safe, but some were badly wounded.

The enemy main attack was now delivered on a wider front, and the tactics were changed. The number of escorting fighters was increased and the size of the bomber formations reduced. The covering fighter screen flew at very great heights and enemy bomber formations were also protected by a box of fighters, some of which flew slightly above to a flank, or in the rear; others were slightly above

and ahead, while still others wove in and out between the subformations of bombers.

On several occasions, this type of formation succeeded by sheer weight of numbers in breaking through the forward screens of R.A.F. fighter forces, and in attaining their objectives, even after numerous casualties had been inflicted. At other times smaller formations of enemy long-range bombers deliberately left their fighter escort, as soon as it had joined battle, and proceeded unaccompanied toward south or southwest London. However, they sustained heavy casualties when they were engaged by the R.A.F.'s rear rank of fighters.

From the twenty-fourth to the twenty-ninth of August, Goering continued to show some interest in Portland, Dover, and Manston, and added other targets as well. Several areas in Essex received attention and there was fierce fighting over the North Foreland, Gravesend, and Deal. At 6:45 p.m. on the twenty-fourth more than 100 German fighters and bombers met a number of R.A.F. squadrons near Maidstone, but the enemy turned and fled before a shot could be fired.

By August 30 the assault was switched to inland fighter airfields. Eight hundred aircraft were used in a most determined effort to destroy the aerodromes at Kenley, North Weald, Hornchurch, Debden, Lympne, Detling, Duxford, Northolt, and Biggin Hill.

September saw no letup in these raids when thirty-five major attacks were made on these airfields, which cost the Germans 562 *known* aircraft destroyed. The British losses were 219 machines, but 132 pilots were able to bail out successfully.

The R.A.F. tactical dispositions were altered to meet the new form of German attack. The effect of this was to meet the enemy in greater strength and farther away from their inland objectives, while the aircraft that were successful in eluding this forward defense, were dealt with by squadrons farther in the rear. An average of 156 fighter patrols of varying strength were flown each day between August 8 and September 5, which gives some idea of the amount of combat time put in by the handful of British fighter pilots during those historic days.

In this almost a month of heavy fighting during which Goering tossed in squadron after squadron of the Luftwaffe in the hope of grounding the R.A.F. fighting force, he accomplished practically

nothing. Some damage was inflicted on airfields near the coast, but the staff and ground services worked day and night so that the operations of the fighter squadrons were in no way interrupted. By September 7, Goering must have known his goal was hopeless, for he switched his attack from the fighter airfields to industrial and other targets, with London still his main objective.

The heavy bombing that summer provided daily incidents similar to this:

One Sunday as people were just leaving church the sirens began to wail. At famed Biggin Hill, where Spits and Hurries destroyed 1600 enemy aircraft during the war, two squadrons were at "Top-Line Readiness." The duty controller noted that several large formations were well inland, flying inexorably toward London. A telephone call broke the tension, and someone said, "They're over Kenley, sir. Jerry's right on top. Bombs falling all over the place." The controller winced for he could visualize what was happening at Kenley. It was a pleasant spot with well-tended lawns, flower beds, and neat peacetime buildings, and was one of the vital sector stations of Number 11 Group which was holding the southern approaches to London.

The Spits and Hurries from Number 64 and 111 Squadrons put up a fight, but the Luftwaffe bombers would not be denied today. When they left six Hurricanes were piles of smoking wreckage and the Operations room had to be transferred to a butcher's shop in Caterham. Every hangar, except one, had been destroyed and the runways were bombed till they looked like no man's land.

Ten minutes after Kenley had been blasted, Croydon was attacked, but Biggin Hill's fighters were kept on the ground. Their controller reached for his steel helmet and tightened the strap under his chin. "Tin hats on, everybody, please," he ordered.

This was the first time that many of them had worn that comic headgear. There is a strange quirk in the British serviceman. He will not wear a steel helmet unless he is threatened with insubordination. And the minute your back is turned, he will discard it again. Some wore them at a jaunty angle, a few were shame-faced with the seeming cowardice of the gesture, and the girl W.A.A.F.s, who had to slip them on over their headsets, were disturbed because the ungainly bowls marred their hairdos.

Then West Malling received a delivery of bombs and everyone in the Operations room sensed that Biggin Hill would be next. The controller finally sent off his Hurricanes and Spitfires.

"Jacko Squadron scramble! Dog-Rose Squadron, scramble! Protect Base!"

The station commander took over the public address microphone and announced: "We may be attacked at any moment. I want all personnel, except those engaged in essential services, to take cover immediately."

Mechanics working on damaged aircraft put down their tools reluctantly and moved toward the trenches. The kitchen staff carefully turned off the heat under the pilots' Sunday dinners. From offices and stores, the W.A.A.F.s chattering like magpies, hurried down to the air-women's shelters. Around the perimeter, the antiaircraft gunners leaped to their Bofors and stared up into the sun. On the nearby village green a company of Local Defense Volunteers anxiously rammed clips of ammunition into their World War I rifles.

"Enemy approaching base," the controller warned his airborne squadrons. "Angels 12 (altitude 12,000 feet). Attack on base imminent!"

"You haven't a thing to worry about," Squadron Leader Ellis reported back. "Here we go. Tallyho!"

But the bombs fell, nevertheless. The first stick hit on the east side of the field, well away from the station buildings. The blast and concussion gave the women in the shelters some idea of what an earthquake was like. Outside, the noise was indescribable, but above the dull drone of engines and the roar of explosive, they could catch the heartening stutter of Spitfire and Hurricane guns.

Stick after stick of bombs rained down. Great geysers of earth were in continuous eruption. One bomb fell on the motor transport shed which, fortunately, was unoccupied, but another fell close to a Bofors gun, killed one of the crew and wounded another.

Suddenly one Dornier 215 bravely came in very low and as it glided over the village green, the L.D.V. old-timers fired a defiant fusillade. To their complete amazement, the Nazi bomber burst into flames, rolled over, and crashed on the far side of the airfield. The cheers could be heard in the base shelters.

Upstairs, the British fighters were outnumbered five to one by the

Do 215s, Ju 88s, and the Me 110s stepped-up in the rear. The Hurricanes first met the enemy over Sevenoaks. They pounded into the Junkers, roared through, and took on the Messerschmitts. In the next fifteen minutes every type of air fight took place. Bombers received two-second bursts, shot out jets of flames, and rolled over. The Me 110s slammed in for revenge, and one Hurricane pilot who was trapped in their cross fire saw his emergency panel fly up from his hood. The slip stream tore at his helmet and almost choked him, and he spun down to 5000 feet before he could set things straight again.

The Spitfires of Number 32 Squadron left the bombers to the Hurricanes and raged up to 31,000 feet where a force of Me 109s was waiting. They tore into the invaders and in a few seconds five spun down to earth in flames; the rest turned back to France. The Spits then went down and joined the Hurricanes, and the raiders were chased back to the Channel.

The raid lasted barely ten minutes and then it was strangely quiet. The station personnel emerged, dirty and disheveled, from their shelters and stared wide-mouthed at a Salvation Army mobile canteen driving across the bomb-packed landing field which was carpeted with still-hot shrapnel.

"Coo! Tea and Wads!" One and all beamed, for never was such homey refreshment more welcome.

The injured were taken to a first-aid shelter and a lieutenant who had been wounded when the Bofors site was hit, was carried in on a stretcher and made comfortable until a doctor could get to him. After that the crew of a Dornier which had been shot down was brought in under guard. Their pilot, a young *Leutnant*, stepped forward and spat into the face of the wounded antiaircraft officer. A W.A.A.F. girl told the doctor later, "I felt like shooting the lot. If I'd had a gun . . ."

Throughout the raid those who were on duty, remained steadfast at their posts. Sergeant Jean Mortimer was in the armory when the alarm sounded, and although she was surrounded by several tons of high explosive she remained at her telephone switchboard to relay messages to the defense posts around the airfield. Then, before the "All Clear," this middle-aged W.A.A.F. picked up a bundle of red

flags and hurried out to mark the numerous unexploded bombs. She carried on even when one belatedly exploded nearby. Her courageous act was acknowledged by the award of the Military Medal, the first of three that were awarded to the W.A.A.F.s of Biggin Hill that summer.

One by one, when their magazines were empty, the fighters came back and wove carefully through the bomb craters and red flags.

Those with any ammunition left kept up the fight. Sergeant Parsons of 610 Squadron chased a formation of Do 17s at 15,000 feet. They went into a tight defensive circle as he approached, so he climbed upsun and waited patiently. Five minutes later one broke formation and Parsons jumped him. He attacked from astern and killed the rear gunner. Although compressed air hissing from his empty breechblocks told him he had run out of ammunition, he continued to feint and succeeded in forcing down the Dornier. Its pilot prudently lowered his undercarriage—a token of surrender—before making a perfect landing on Romney Marsh.

During the heat of the battle, Flight Lieutenant Russell, who previously had been assigned to the Operations room and was on his first combat mission in some weeks, shot down an Me 110 and was delightedly reporting his success by radio when a cannon shell exploded in his cockpit. He bailed out and found he had been shot through the leg; blood was streaming from the wound and as he floated down he applied an efficient tourniquet. When he reached the hospital the physicians congratulated him on the professional job performed while he was suspended in the air at 10,000 feet.

Compared to Kenley, Biggin Hill got off lightly. Five hundred bombs were dropped, including ninety delayed-action types. Only one direct hit was scored, and only two people were killed. When a bomb-disposal squad arrived they found to their disgust that some of the unexploded bombs were British, captured during the retreat from France, and several were dated from the early 1920s.

Frustrated in his effort to destroy the British Fighter Command on the ground, Goering decided to take his revenge on the city of London. Beginning with two attacks on September 7 he sent over anything that would carry bombs, and fully escorted with new forma-

tions of fighters. By now the attackers were flying at greater altitudes, some waves coming through at 15,000 feet in sunny skies that made the task of the Observer Corps all the more difficult. Although an early type radar screen was available, the distance across the Channel did not allow much time for the interpretation of the blips, and there were occasions when direct observation was more reliable.

As part of a new plan, enemy dive bombers reappeared in attacks on coastal objectives and shipping off Essex and Kent, and were intended as a diversion since they usually came over while the mass attacks by longer-range bombers were in progress. The Germans increased their assaults by single aircraft at night, which made sleep almost impossible for the civilian population. These individual raiders made no attempt to strike military targets. They dropped bombs indiscriminately over a wide area of London.

All the attacks, carried out between September 7 and October 5, were essentially the same, being made in two or three waves at intervals of about twenty minutes, with the whole attack lasting about an hour. The German squadrons were usually met near the sea. The Hurricanes that took off first, engaged the fighter escorts, and were followed by other squadrons that went for the bombers. There were dogfights all over Kent and the air was vibrant with machine-gun fire. People on the ground described it as the sound made by a small boy running a stick along a stretch of iron railings. High above was the faint roar of hundreds of engines, which now and then swelled to a dreadful note as some crippled enemy fighter or bomber fell to the ground, or tried to make its base with a swarm of Spitfires diving on it. Sometimes the blue field of the sky would blossom with white parachutes.

In this last desperate attempt to win victory, Goering still relied on superior numbers; his Luftwaffe delivered thirty-eight major attacks by day before he gave up. He lost more than eight hundred aircraft between September 6 and October 5. These figures have been totaled and retotaled time and again. The British found discrepancies in some reports. For instance, it was long believed that on September 15, their greatest day, they had downed 185 aircraft. Later tabulations reduced this figure to considerably less than that, but the over-all totals are fairly reliable.

What brought about this success? How did the R.A.F. beat off this formidable armada? Unprejudiced authorities have attributed the British victory to three main factors: 1) The British fighter aircraft were superior to the German in almost all technical characteristics—speed, firepower, and maneuverability. 2) The British aircraft operated with complete interior lines of communication and out of home bases; thus short-range fighters could be refueled and used over and over again. 3) National morale, the indomitable will to survive that was shown by every Briton from the humblest laborer to the fighter pilots themselves, unquestionably played an important role in the magnificent stand. Finally, indirect American assistance in the form of aircraft, armaments, shipping, manufactures, and food was making itself felt by this time.

November 14 marked the opening of a new phase of the Battle of Britain. Goering switched to night attacks, since he was no longer able to stand up to the devastating losses inflicted by the R.A.F. during the day. He sent five hundred bombers on a concentrated raid on Coventry, then an important munitions center. Incendiaries and high explosive rained down for more than ten hours, virtually leveling the Midlands city to the ground, and killing hundreds of civilians.

In the next few weeks, Southampton, Sheffield, Bristol, Birmingham, and Liverpool underwent the same horror. The climax was reached on December 29 when a savage incendiary attack was carried out over London, and by the end of 1940 German bombings had taken a staggering civilian total of 23,081 killed, and 32,296 wounded; but the high spirit of the British people was cemented more firmly than ever.

In spite of the carnage, the R.A.F. grew in strength and striking power. The German invasion fleet on the shores of Europe was battered to splinters in a series of raids that denied all Hitler's hopes of a British invasion.

Night after night, the R.A.F. fought its way across the Channel to revenge Coventry. German air and submarine bases from Bergen to Bordeaux were blasted incessantly. It struck deep into Germany and even crossed the Alps to raid Italy. The Ruhr, Berlin, Bremen, Mannheim, Danzig, Pilsen, Turin, Genoa, and Milan all felt the hate of the British airmen.

Following a large raid on London, Bremen was bombed in reprisal with three terrible incendiary raids. Despite the fact that the R.A.F. had a limited number of long-range targets, it persistently carried the fight to the enemy and, as far as humanly possible, concentrated on military targets rather than open cities.

CHAPTER III *While Britain Stood Alone*

[1941]

MUCH HAS been made of the fact that with the fall of France, Great Britain was left alone to withstand the Nazi onslaught. In essence this was true, but as one Cockney character in *Punch* cryptically observed: "They say our poor old Empire is all alone in the war, and so we are—all five hundred million of us."

The British put on a memorable stand and won the admiration of the free world. Still staggering from the fury of the Battle of London, Britain never had so many friends in her recollection. Her empire was more firmly cemented than ever, and in America thankful praise went out to her for her valiant stand. Bundles for Britain worked prodigiously, and sympathy backed by sincere respect filled a hundred ships with practical tokens of esteem. The Union Jack flew from staffs all over the United States; hundreds of British children were welcomed into American homes and given shelter from the Nazi blitz; British seamen from ships tied up in American shipyards for war-damage repairs, were hospitably entertained by city and suburban families. In spirit, America was as much a part of the Empire as any member of the Commonwealth.

And there were other manifestations of practical support and friendship, for history repeated itself. Soon after aerial hostilities began, many Americans offered their services to the R.A.F. Others who remembered stories of the old Lafayette Escadrille hurried to Paris to fight with the *Armée de l'Air*. There Charles Sweeney, who had helped to organize the original Escadrille Américaine in 1914, rounded up some U.S. volunteers, but little came of this second

venture. Most of them were thankful to escape in 1940 and join a group of American pilots in Britain who were already in training or fighting with the R.A.F.

Take the case of Arthur Gerald Donahue, who was the first American to see air combat in World War II. He had grown up on a two-hundred-acre farm near St. Charles, Minnesota, and after graduating from high school as an honor student, took up flying and gained a transport license before he was nineteen years old. Air-line jobs were scarce so he instructed student fliers and barnstormed at country fairs and carnivals. At times he drove a truck on construction jobs and frequently returned to the farm to lend a hand during harvesting seasons.

In 1938 Donahue flew to Laredo, Texas, to join a friend who was establishing a flying field for training student pilots, and for aerial taxi work. By this time Donahue had flown practically every type of aircraft in general use in the United States.

Early in the summer of 1940 he returned home to help on the farm and as late as mid-July was riding a cultivator in his father's cornfield. Two months later, as a pilot officer in the R.A.F., he had been shot out of the sky over Dover and was in a British military hospital where the doctors sought to save his life. In 1941 he returned home for a brief leave, but he soon went back to England to resume where he had left off.

There were enough volunteer Americans in Britain by October 1940 to form the first Eagle Squadron, which became operational as Number 71 R.A.F. Fighter Squadron. It was commanded by Squadron Leader Walter Churchill, an Englishman who had considerable experience. Charles Sweeney was given an R.A.F. uniform and made Honorary Commanding Officer for his work in helping to organize the unit.

The following Americans escaped from France and formed the nucleus of this Eagle Squadron: Newton Anderson, Vernon C. Keough, Michael Luczkow, Andrew Mamedoff, Virgil W. Olson, and Eugene Q. Tobin.

For a time the British government was hesitant in accepting American citizens in the R.A.F., but realized later that if a sufficient number could be induced to join, an all-American squadron could be organized, which might influence others to volunteer, gain official

recognition in the United States, and the sympathetic support of the American public in general. The U. S. newsmen in London naturally made the most of this small volunteer group and shortly there were enough responses to justify the formation of two more Eagle Squadrons. By August 29, 1940, the first unit was included in the R.A.F. fighter squadrons assigned to the defense of Britain, but it was not ready for actual patrols until late in October. Few of the members of the unit fired their guns until they were put on night patrols, after Goering had switched to after-dark bombing. Number 71 Squadron did not get into concerted action until late April 1941. In the next twenty months Eagle Squadron pilots accounted for seventy-three aircraft. Twelve men were awarded the Distinguished Flying Cross and one was honored with the D.S.O. After one year of combat, they had twelve casualties—eight had been killed, three were missing in action, and one was known to have been taken prisoner. At the end of its second year, the original Eagle Squadron had but four left of its complement of thirty-four men. More than one hundred of these volunteer Americans had been lost over enemy territory. By that time two other Eagle Squadrons had been formed, Numbers 121 and 133, led by Donald J. M. Blakeslee and Carroll W. McColpin. In addition, there was another R.A.F. squadron serving in Malta which consisted almost entirely of Americans.

Probably one of the most renowned of the Eagle Squadron personnel was Chesley Gordon Peterson, a soft-spoken, sandy-haired man, who fought a Jekyll and Hyde war. On the ground Peterson was an easygoing type who all too often was underrated by his subordinates until they flew combat missions with him. Then he became a "killer" who wound up his war with nine enemy aircraft destroyed and seven "probables."

In the fall of 1944 the author met Peterson and his actress wife Audrey Boyes on board a military transport that was returning to the United States. In several long talks during this trip he related that he had been raised in a Mormon family in Santaquin, Utah, that he always had been keen to fly, and at the age of nineteen doctored his birth certificate, raising his age to twenty-one, in order to join the U. S. Army Air Corps. He was accepted and completed his primary flight training at Lindbergh Field, San Diego. His basic was taken at Randolph Field, but he was washed out there for "lack of flying

ability." Four years later Peterson was a commander of a fighter group in the U. S. Eighth Air Force and the youngest colonel in all the U. S. military services.

Pete was noncommittal about his being eased out of the Air Corps. At times he explained blandly that he was punished for disfiguring his birth certificate, but when the war was ended, he laughingly said, "So help me, I was kicked out!"

After he left Randolph Field he worked for Douglas Aircraft in Santa Monica, California. It was while he was there that he heard some surreptitious reports that Charlie Sweeney was trying to organize an American squadron to fight in France, so he ignored the Air Corps judgment and decided to fly again.

"We volunteers were doing swell until we crossed the Canadian border and were being interviewed in Toronto. There the U. S. police stepped in and read the Neutrality Act and ordered us to beat it back home, on penalty of losing our citizenship." He grinned as he related his experience.

He went back to Santa Monica and Douglas Aircraft again. By June 1940 American concern over the progress of the war and our new admiration for the British, eased these strictures somewhat, and the old legal barriers were lowered. Peterson hurried back to Canada where he received some so-called refresher training and was soon sent over to England.

Pete arrived in Britain in August 1940, along with a few other volunteers, and although they were given some advanced training on Hurricanes, few of them saw any action during the Battle of Britain. Instead, they were stationed in the north of England where their training was honed to a fine edge. By April 1941 they were truly operational and Peterson put the United States in the war news by winning the Distinguished Flying Cross in October. In December he was awarded the D.S.O. for "high courage, magnificent leadership, and devotion to duty."

Peterson had a narrow escape in August 1942 when he was fighting a German Ju 88 during the Dieppe raid. The Jerry was knocked over on his back, but in the scramble Pete's Spitfire was hit and started to blaze, and for the first time the young American had to take to the silk. As he floated down into the Channel he blazed away with

his Webley pistol to attract the attention of an Air-Sea Rescue craft that picked him up within twenty minutes.

By autumn of 1942 the first units of the U. S. Air Corps were beginning to arrive in England and on September 29, all Eagle Squadrons of the R.A.F. were transferred to the American service to form the Fourth Fighter Group. Peterson took a two-weeks' leave back home to Utah, and then returned to the war and was assigned to lead this new pack of Thunderbolt pilots.

Pete had his closest call while flying a Thunderbolt in a dogfight over Holland; a cannon shell from an F-W 190 knocked out his engine and he tried to coax the heavy machine back to Britain, but half way across the Channel the P-47 became unmanageable and he had to bail out at about 1000 feet. There wasn't much time for him to get control of the parachute and he hit hard, blacking both eyes as he fell face first. The Channel was very chilly, but a British Walrus flying boat rescued him and hauled him to a hospital, where he was kept for about four days recovering from shock, temporary blindness, and untold bruises.

After becoming a Group Commander, Colonel Peterson won the American Distinguished Service Cross in July 1943 while leading a fighter formation that was covering a group of Flying Fortresses heading for an important target in Germany.

He spotted eight enemy aircraft poised for an attack on the B-17s, and ordered his fighters to stay in formation while he tore into the enemy element alone. He destroyed one, damaged another, and sent the rest back to their bases.

Colonel Peterson was still flying combat missions at the end of hostilities, and in conjunction with his fighting career, he will also be remembered as the young, but experienced officer, who initiated the fight to have the P-51 Mustang fighter adopted by the Air Corps. This aircraft, originally designed by North American to British specifications, came close to being one of the costliest mistakes made by the Army Air Force in World War II.

By 1943 it was clear that Allied bombers would require full fighter escort if an effective campaign of strategic bombardment against Germany was to be maintained. Prewar assumptions of the "ascendancy of bombardment over pursuit" had long since been dropped, but there still prevailed an opinion, formally expressed in 1940, that

"no fighter plane can be designed to escort heavy and medium bombardment to their extreme tactical radius of action," and there engage in offensive combat with enemy interceptor fighters on equal terms. The escort plane, it was concluded, "in order to have the range and speed of the aircraft it accompanies, may be as large and as expensive as such aircraft." When plans for the giant B-36 were under consideration in 1941, it was suggested that a fighter escort of comparable size might have to be provided.

The answer, obviously, was that some method would have to be found whereby the available fighters could be given greater range by improved fueling systems. The distances of war theaters from the manufacturers, and the hazards of ocean shipping, demanded that this problem be quickly solved. Colonel Peterson was one of the first to realize that the P-51 Mustang was the available fighter that would fill the bill, but his suggestions and reports were ignored for some time.

The P-51 turned out to be the Allied answer to the problem. Actually, the P-51 may have had its genesis in a series of improvements *contemplated* by the Air Corps for the early P-40, and perhaps the Curtiss Company gave this data to North American. Some authorities insist that the Mustang was actually a variation of the Spitfire design, evolved to take the American Allison engine, but later versions were all equipped with the British Rolls-Royce.

At any rate, the British first put the Mustang to work in their Army Co-operation Command for low-level ground support, and after a few weeks, R.A.F. pilots were quick to declare the P-51 to be "the best American fighter which has reached this country," and some compared it favorably with the Spitfire.

The Mustang was a fortunate design that allowed many phases of modification. Most fighter aircraft were not so adaptable. It was fast, maneuverable, easy to fly, and simple to maintain. When it was realized that a long-range fighter would be needed if the Allies hoped to carry the bombing war deep into the enemy's munitions areas, the Mustang fitted every requirement. It was sturdy enough to take extra engine power; it had a wing design that accepted a dozen different auxiliary fuel-tank arrangements, and yet with all the extra weight she still flew like a true fighter and outfought the best the enemy could put up against her.

Peterson loved the Mustang and continued to send in complimentary reports concerning its capabilities and performance. Major Thomas Hitchcock, then assistant military attaché in London, stated that "the P-51 is one of the best, if not the best, fighter air frame that has been developed in the U. S." and he suggested development of the Mustang by cross-breeding it with the Rolls-Royce Merlin-61 engine. Other people confirmed Major Hitchcock's report, and within a month the P-51 was being tested with the new engine, and 2200 were eventually ordered for the U. S. Air Corps.

There was, of course, some delay due to the extensive changes to be made in the air frame to accommodate the Rolls-Royce, and it was not until November 1943 that the Air Corps had a P-51 Group in the United Kingdom. It flew its first long-range mission on December 13 to Kiel and back. Without external tanks, it could escort bombers to a point approximately 475 miles from its base, or about the same range as the P-47 with two 108-gallon wing-auxiliary tanks. The following March the P-51, with two 75-gallon wing tanks, could escort to a point about 650 miles from its base; with two 108-gallon tanks it could reach the unheard-of escort range of 850 miles, and eventually the Mustang's combat range was stepped up to 1800 miles.

The Axis-British struggle for control of North Africa and the Mediterranean, seasawed back and forth from the end of 1940, and well into the early months of 1941. The British objective was to drive back the Italians from western Egypt, continue this move along the Libyan coast and eventually destroy the Italian territorial armies.

Marshal Rodolfo Graziani had 250,000 men and 350 first-line aircraft at his command, but he misused them. The British forces totaled less than 100,000 and scarcely 100 available aircraft, but these were used so well that Graziani was soon beaten; more than 40,000 prisoners were taken in about a week. British air attacks demoralized the enemy, cut his communications, scattered his light armor, and sent him reeling back to Bardia where another 45,000 troops were taken.

Unfortunately, however, much of General Wavell's North Africa forces and equipment had to be rushed across the Mediterranean to

give assistance to Greece where the British were saddled with a new campaign that began on February 15, 1941. This was a hopeless task, one that had been accepted only to retain the political honor of the British Empire, and possibly with some hope that a foothold could be maintained in Europe for future operations.

This British intervention resulted in disaster. They met well-trained Germans who were backed by splendid air power. Lieutenant General Alan Brooke, who became Chief of Britain's Imperial General Staff, wrote later: "Why will politicians never learn the simple principle of concentration of force at the vital point and the avoidance of the dispersal of effort?"

Not only were the British forces driven out of Greece, again losing almost all of their military equipment as they had in Norway and France, but as a result of this dispersal of their slender Middle East force, they failed to hold the island of Crete and the airfields which General Richard O'Connor had captured in western Cyrenaica, both of which were of vital importance to the command of the eastern Mediterranean. The tragic evacuation of Crete in May in the face of strong Luftwaffe forces, involved losses that neutralized the earlier victory over the Italians off Cape Matapan, and almost resulted in the withdrawal of the British fleet from the Mediterranean.

Crete was not a complete disaster, although it magnified German air power, and her hordes of parachute troops gave the free world a memorable scare. At the time very little was known of the action for there were no British or American correspondents on the island and what news came out was prepared mostly by German propagandists. The only Allied newsman on Crete throughout the whole campaign was Bob Miller, official correspondent with the New Zealand forces. Geoffrey Cox, another newspaperman who had been a correspondent at one time for the London *Daily Express* and had joined the New Zealanders as an artilleryman, was withdrawn from his battery in Crete to edit the one-sheet paper *Crete News* for the troops. It was from this little paper that a few interested newsmen eventually wrote the real story of the Battle of Crete. In his book, *Retreat to Victory*, Allan A. Michie wrote a memorable chapter,

"Dunkirk in the Mediterranean," from which this story of Crete has been drawn.

For years the Battle of Crete has been dismissed as just another British blunder. It was a military defeat, but as one phase in the complicated campaign they were fighting in the Middle East, it provided a lot of factors that cheered British commanders. For one thing the resistance put up on the Mediterranean island ended Hitler's march through Europe, and for the third time in two months—as in Yugoslavia and Greece—he was forced to commit every destructive weapon in his arsenal to gain a victory.

The Nazi occupation of Crete was to be a steppingstone on the route to the Suez Canal. They planned to take the island in two days and then the Luftwaffe was to roar into Syria, where, with the support of Vichy France, they would consolidate their position before striking out at Iraq. After Iraq, they intended to take over Iran which would have put the Germans on the high road to India by the end of that summer of 1941. Instead of being blasted off in two days, the British held on from May 20 until June 1, a total of twelve days. The Luftwaffe was weakened at a time when British and American airplane production was beginning to pull even with Germany's output. When the fighting ended, Crete looked like an aircraft graveyard with airplanes and gliders piled up on all the beaches and airfields. Some 200 fighters and bombers were shot down, or crashed. More than 250 troop-carrying aircraft had been destroyed.

The Nazi invasion troops took a mauling that will long be remembered. At least a quarter of their highly trained parachute and airborne troops was killed, a large portion was severely wounded, and the remainder confined to rest camps for long periods. Germany's 1st Parachute Division was so battered, it was not able to take an effective part in the Russian war until the following September when it made an unsuccessful attack on Russian positions in the Crimea.

The Battle of Crete certainly exploded the belief that parachute troops were unbeatable. It is now generally thought that without their absolute superiority in the air at the time, the Germans could not have taken Crete with 100,000 parachutists. Crete was the most clear-cut triumph of air power over sea power that had been seen up to that time. As a preview of any Nazi hope of an invasion of the

British Isles, Crete proved that the combination of parachutists, airborne troops and equipment, and sea landings cannot hope to succeed unless they can gain mastery of the skies.

The British Navy took a wicked beating at Crete. They admitted losing four cruisers and six destroyers, which was more than the Italians had lost at the battle of Cape Matapan when the Fleet Air Arm sent three Italian cruisers and three destroyers to the bottom. The British cruiser, *Dido*, just managed to limp into Alexandria with its bridge completely blown away by German dive bombers. The aircraft carrier *Formidable* and the battleship *Warspite* were hit, while the *Orion* which was loaded with evacuated troops, took the full impact of an air bomb.

The casualties were heavy on both sides. About 17,000 British, Australian, and New Zealand troops were safely withdrawn. About 15,000 others, plus several thousand Greeks and Cretans were killed, wounded, or left on the island to await capture because they could not be evacuated in time. Many British units were cut to pieces. The Royal Marines who staged most of the rear-guard fighting lost 1400 dead, wounded, and captured of their strength of 2000 men. As a comparison, British losses during the Dunkirk withdrawal were 12 per cent. In the Battle of Crete they were nearly 50 per cent. At least 12,000 Nazis were killed or wounded, and of the 5000 who tried to land via small boats, practically all were wiped out by British naval forces.

As in Belgium, Holland, France, and Greece, the German superiority in the air eventually brought victory. At the time of the Crete battle the R.A.F. in the Middle East had less than fifty serviceable fighters to oppose the full weight of the Luftwaffe. The Nazis worked out of Greek bases close at hand, while the outnumbered R.A.F. had to fly from strips in the Egyptian desert, at least 350 miles away. In the end the British pilots were ordered to fly from Egypt to cover the evacuation. Their Hurricanes and American Tomahawks—an improved Curtiss P-40—carried enough gasoline to give them about ten minutes of fighting when they reached Crete. There was no return trip, for the pilots were instructed to fight until their fuel ran out and then parachute down and await capture. The more fortunate airmen managed to crash-land in the sea near British naval vessels where they were fished out to fight again.

The German invasion began with an aerial blitz on the morning of May 20, but for four previous days formations of dive bombers had blasted the small harbors and fields around the island. These preliminary raids destroyed most of the Hurricanes and Brewster Buffaloes the R.A.F. had on Crete, and those that could fly were withdrawn to Egypt on the assumption that they would be helpless against the massed air attack the Germans were expected to launch. Thus, on the day of the invasion, there was not one British machine on the island to meet the Luftwaffe.

The first wave was murderous. Big Dorniers and Heinkels attacked with heavy stuff from 2000 feet, and once they were out of the area, the Stukas dive-bombed from treetop level. After them, came wave after wave of Me 109 fighters that machine-gunned anything that moved, men, women, children, or barnyard cattle. The defenders could do nothing but hide in their trenches. They had no antiaircraft weapons, not even Lewis or Bren automatic guns; just their regular .303 Lee-Enfield rifles.

There was a short lull, and then suddenly the air was filled with the harsher roar of transport airplane engines. Junkers 52s and Focke-Wulf cargo craft droned over at a few hundred feet. They opened their doors and an average of thirty parachutists tumbled from each transport. They wore special quick-opening, fast-falling 'chutes which put the troopers safely on the ground in twenty-five seconds. Behind and above them billowed other parachutes bearing canisters of supplies. Great black gliders that had been towed behind the transports and released when the coastline of Crete came into view, next hissed down. Some of them were aquaglidors, equipped with outboard motors that chugged them ashore. Others had land skids and sailed quietly into plateau areas or settled on the beaches.

The British troops were ready for this intrusion. When some three thousand paratroopers were landed in a few minutes near Canea, the capital city of the island, they were killed almost before their feet touched the tawny earth of Crete. The New Zealanders knocked them off with rifle fire—like hitting Ping-pong balls in a shooting gallery—and what few landed safely and hurried toward the olive groves were soon rounded up and their parachutes taken for bivouac tents.

That afternoon more Nazi paratroopers were dropped, but at the

close of that first day, 80 per cent of them had been killed, wounded, or captured. Near Maleme airfield, however, a large force of Germans managed to hole up in a wadi—a dry river bed—where they entrenched themselves behind mortars and machine guns that were dropped from supply planes. The British were unable to bring their field artillery up to bear on them, and repeated attempts to drive them out failed. It was this resisting pocket that ultimately won the Battle of Crete, for these smart paratroopers, reinforced by hundreds of others dropped into the wadi, held Maleme airfield long enough to enable the Luftwaffe to land thousands of men from troop-carrying airplanes, who in turn moved out to spark the main attack.

On the second day, the Nazis repeated their tactics, but on a larger scale. They were still amazed at the resistance and instead of making surprise attacks themselves, which is the chief weapon of the paratrooper, they found themselves fighting for their lives before they could slip from their 'chute harnesses. They had expected to find only a few poorly armed Greeks and Cretans defending the island; their Intelligence had apparently missed the fact that more than thirty thousand British and Greek troops had been evacuated from Greece and been left behind to defend Crete.

By nightfall of the second day several thousand Germans held a line two or three miles deep across the east end of the airfield. Troop carriers tried to land on the beach that formed one side of the Maleme field, only to crack up. Others piled up on the field itself, but the Nazis ignored these losses in either men or material; airplane after airplane churned in, lumbered down, and if they landed safely, took off immediately in a cloud of dust.

At dawn the next day the British tried to counterattack with the New Zealand troops assigned to the fight. As they waited for the whistle they were treated to a grandstand seat that showed the Royal Navy in action. Naval Intelligence had learned that the Germans were bringing a surface invasion fleet to Crete on the night of May 21. Moving silently up and down before the point on the north coast where the landing was to take place, the warships were ready for the Germans. At midnight the coast shook with heavy gunfire. Searchlights slashed across the water betraying dozens of small Greek caiques and coastal steamers, which the Royal Navy gunners picked off one by one. When it was all over, the sea was empty, except for

two burning ships, one of which continued to illuminate the night with a series of explosions. Only a few German soldiers were rescued.

The New Zealand counterattack on Maleme was successful. By skirting the beach, the Maoris fought their way through the German defenses and actually reached the center of the airfield. The Germans were firmly dug in here, and in the village of Maleme where they occupied well-built houses. The attackers snapped on the bayonet, tossed grenades, and shouted in a wild bluff. The Germans threw down their weapons and attempted to run away. The New Zealanders doggedly wiped out post after post, captured house after house, until they had the whole village. But even that wasn't enough. The German Stukas came back in broad daylight and hammered the new defenders of the air field.

With no antiaircraft measures, it was impossible to hold on and, overnight, plans had to be made for a new retreat that would take the troops over the backbone of mountains to the southern side of the island.

The Luftwaffe did not leave the sky between dawn and dusk, but the British continued to maul any paratroopers that dropped within shooting distance. "If they want to take this place, they've got to come down here on the ground to hold it," one New Zealander said defiantly.

On the afternoon of the third day the Germans began a sturdy attack on a large scale from out of Maleme. They opened with heavy mortar fire that was particularly effective on that flinty ground, and Messerschmitts came down and added to the hate. The Allied troops were forced to take cover in the olive groves and the shallow ditches along the country roads.

While this was pinning down the defenders, more troop-carrying aircraft arrived at the rate of one every three minutes. In a short time the Nazis had 35,000 first-class troops available. The future seemed hopeless, but the New Zealanders, in particular, fought the airborne troops to a standstill. At the end of the sixth day their ammunition had to be conserved, whereas the Germans intensified their mortar fire and aerial bombardment. As many as six shells a minute burst among the tattered defenders.

The enemy rushes were beaten off for two hours, but after a violent dive-bombing attack, the German infantry poured over in six waves.

One New Zealand company was overrun, but another managed to make a fighting withdrawal. Eventually the whole defense force had to fall back east of Galatos, which was occupied by the Germans. Two light British tanks were found and sent clattering into this village, shooting surprised Germans on the streets. The tank men roared out again and offered to return if two wounded crew members could be replaced. Almost the whole New Zealand ground force volunteered, but only a machine gunner and a young officer were selected. At that point two companies of New Zealand infantry rushed up and demanded to be allowed to join the two-tank foray. The tank attack began in the early evening light, with the New Zealanders charging forward on both sides of the armor. They scrambled over brick walls, rushed house after house, until German dead carpeted the streets. The Nazis fled, and a handful of Anzacs had possession of Galatos which they held long enough to allow a force of New Zealand cavalymen to complete their escape from the enemy encirclement.

The evacuation of Crete was ordered that night.

From that point on the story was much the same. New Zealanders and Australians retreated gradually along the north side of the island until they came to Suda Bay. British Commandos held the last line while the retreating troops passed through them. On the night of June 1, the bulk of the British force was evacuated to Royal Navy destroyers anchored just off the harbor of Spahkia. A small company of New Zealanders volunteered to remain another day as a rear guard in the hills overlooking the town, while the navy made a second evacuation attempt the following night.

When the last boat pulled away from the beach at least 15,000 living, wounded, and dead Allied troops had to be left behind. Many of them continued to fight in the hills, unaware that a retreat had been ordered.

It was a glorious, if hopeless, stand. The men who fought in the Battle of Crete will long be remembered as the finest specimens of military training, but in that campaign the Germans taught the world the complete concept of tactical aviation. Never before had aircraft been so well co-ordinated with ground and naval forces. Never before had airborne infantry carried out its task so well, even under most hazardous conditions. The combined operations of the airborne

infantry, surface craft, and air-power support, taught the allies much that was used later in the various invasions along the Mediterranean, the Atlantic, and Pacific oceans.

Through the harrowing months of 1941 when the British stood alone, they enjoyed some measure of satisfaction from interviews with R.A.F. pilots that were presented over the British Broadcasting Company airwaves. In many of these talks the pilots related exciting actions against the enemy while flying in American-built aircraft, and these feature programs were relayed across the Atlantic for Canadians and Americans to hear. The author remembers one report by an unnamed British airman who had been flying a U.S.-built Douglas A-20A, better known to R.A.F. personnel as the Boston.

This smallish, two-engined attack airplane had good speed, maneuverability, and terrific fire power, and to the more imaginative, the Boston, sometimes called the Havoc, might have been considered a twin-engined fighter. Except for the large nacelles that held the 1350-hp Double-Cyclone engines, the A-20A was a very presentable performer.

In this particular instance the pilot, who had been assigned to night-fighter duty, evidently loved his mount for he spent many enthusiastic minutes expressing his personal opinion of this American aircraft. He also had the happy knack of explaining the technique of night-fighting and the qualities required by the pilot for this type of work.

"Personally, I love night flying," he explained. (This text matter is taken from a copy of his prepared script.) "Once in the air, setting a course for enemy-occupied country, one gets a tremendous feeling of detachment from the world. And when the enemy's air base is reached, there is no thrill—not even in big-game hunting—that is quite the same.

"On goes the flare path lighting the strip for a returning Luftwaffe bomber. I could see him making a circuit of the landing field with his lights on. My lights were off and my engines throttled back. I am but a mile or two away, and I can feel my heart dance with anticipation. I bang the throttle open, the stick is thrust forward, and we are tearing down in a hissing rush.

"One short burst from the guns is usually sufficient. The enemy's

glide turns into a sharp dive—the last dive he is ever likely to make—but whether you hit him clean or not he is likely to pile up in fright.

"I remember particularly one night aboard a Boston when I got an He 111 for certain and an old Ju 88 as a probable. It was the night of the last big raid on London, and the Jerries were streaming back to their bases in swarms. I got a crack at a Stuka as he went down with his navigation lights on. My bullets appeared to enter the starboard engine and fuselage and my forward speed carried us over the enemy plane and as we passed, my rear gunner poured a longish burst into the port engine. With that the Ju 88 went into an almost vertical dive, and since she was only about eight hundred feet up, it is quite unlikely the pilot could have pulled out, apart from the fact that both engines were damaged. However, we claimed him only as a probable.

"After this, all the airfield lights were turned off. We climbed away until they turned them on again, after which we bombed the place and set up several big fires. Naturally, they doused the landing lights again since there were still several bombers stooging about waiting to land.

"We came down to one thousand feet again and almost ran into a He 111. I opened fire at close range and my bullets appeared to enter one engine and the fuselage. A second burst started a fire and smoke poured from both engines. As she slithered into a steep side-slipping turn, my gunner finished her off with another burst.

"Then one night, after we had bombed the airfield at Douai, we came upon a Focke-Wulf Condor four-engined transport. It had its navigation lights on, and was about to land. We threw the Boston around fast and from about fifty yards range, I put a good burst into the transport's belly. It was all that was necessary. The Condor gave out an enormous flash of light, burst into flames and blew to bits. Burning debris flew past my aircraft on all sides. The flash was so blinding and the concussion so great, for a few seconds I thought our machine had exploded.

"My most recent thrill, flying one of these American planes, came a short time ago when I got an enemy aircraft destroyed and damaged two others over a field I had visited quite by chance. I just happened to go that way and was overjoyed to find myself there at the right moment. Only a few enemy aircraft were operating that night and I

was fortunate in that I was able to have a crack at three of them. Having a good aircraft when you are far from home and over Jerry bases, has a great effect on the morale of our night-fighter crews."

The most successful air fighters of 1939-45 were those who could shoot straight and work out deadly deflector-angle bursts which caught their adversaries unaware, or were such dexterous pilots they could make their attack, deliver a deadly pattern of gunfire and maneuver out of range before the enemy crew could bring their weapons to bear.

The Germans, who gained much success and experience in the Spanish Civil War, must be credited with most of the development of the fighter tactics that were used in the early years of World War II. They discovered in Spain that the speed of their Me 109s made close formations impracticable for air combat. The wide turning circle of their fighters required a more flexible pattern; the only method in which the individual pilots could hold their positions in the turn and keep an alert lookout at the same time. The high closing speeds, especially in head-on attack, made it essential to identify enemy aircraft as quickly as possible if the leader hoped to maneuver his element into a good attacking position.

So it became necessary to fly loose, open-formation, combat missions with the aircraft spotted at separated heights—positions which permitted the individual pilots to cover one another and search a greater area of the sky than before.

The Me 109 pilots devised what, up to now, had become the perfect fighter formation. It was based on what they called the *Rotte* (file), an element of two fighters, in which some two hundred yards separated a pair of 109s, and the main responsibility of Number 2, the wing man, was to guard his leader from a quarter or an astern attack. This arrangement was quite flexible, however, for there would be situations when the leader would find it necessary to cover his wing man.

They also used a *Schwärme* of four fighters, which consisted of two of the above pairs working in co-operation.

The R.A.F. adopted this formation and called it the "finger-four" element. If you look at your outstretched fingers of the right hand, palm down, and assume that the sun is glaring down from the left,

the tip of the large, or middle, finger becomes the element leader. The index finger designates the leader's Number 2, whose task was to search the downsun area of the sky. The wing man flew lower than his leader so that the other pilots could see him well below the glare of the sun. Since most attacks developed from the sun, a constant search had to be maintained in this direction. Numbers 3 and 4 flew on the right side of the leader, but slightly higher in order to provide two pairs of eyes to scan the danger area.

In flying the average fighter airplane some five miles above the earth, the wings hide about one thousand square miles of ground area. If the "finger-four" formation is properly flown at varying height intervals, it provides the best means of covering these blind areas below each individual aircraft. At the same time the formation is loose and maneuverable; the three pilots following the leader can search their respective areas of sky and keep him in sight without a great deal of uncomfortable neck twisting. The "finger-four" is said to be easy to fly and far less tiring than line-astern. It permits an excellent all-around view and the two wing men, Numbers 2 and 4, separated by a distance of five or six hundred yards, can guard the vital area above and behind. It can be quickly split up into its basic elements of two aircraft, and it is a simple matter to build it into a squadron or wing formation.

Some critics claimed that frequent turns made it difficult for the two wing men to hold their flanking positions, but R.A.F. pilots simply slipped into line-astern spots behind their leaders during tight turns and combat maneuvers. This "finger-four" formation was eventually flown by fighter aircraft on both sides of the line. It has survived the test of time and the jet age; it was used by both Sabre jets and Red MiG-15s during the near-sonic fighting over Korea, and today supersonic fighters carry out their operational training in this proven fashion at speeds well over one thousand miles per hour.

A further advantage of this loose pattern is that it is less conspicuous than a tightly packed, geometrically beautiful formation of massed aircraft.

High-speed fighting tactics must be simple. In the first place the effect of gravity pull on the pilot, although not as severe as once feared, causes short periods of blackout, and by the late 1930s it was evident that fighter tactics would have to be simple. The leader can-

not retain control of even a small formation if he indulges in a lot of complicated maneuvers; his force will be soon broken up into a number of ineffectual elements. His real task is to bring all the guns of his fighters to bear against the enemy in the shortest time.

Night-fighting furnished an important but little-known chapter to the air war of 1939-45. In the First World War few night-flying operations—except special long-range bombers of the Independent Air Force, the forerunner of our Strategic Air Service—were attempted, and neither side had essayed much in the way of fighter reprisal.

The British realized that if Hitler carried out any of his wild threats, he would give priority to all-out bombing, and in the years immediately before the war, all such talk in Britain was based on the "knockout" blow that would be delivered from the air. They acknowledged that they were faced with a potential enemy who could send against them some fifteen hundred first-line bombers that were capable of attacking London from bases in Germany. The fact that they could not be escorted by their fighters until they had bases nearer to the British coast, was not seriously considered in 1938, since the R.A.F. had virtually nothing that could intercept or destroy either bombers or fighters.

The Hurricanes and Spitfires of this prewar era were day operations aircraft, but a few inspired minds on the Air Staff considered the possibility of developing a weapon that would carry sufficient armament, fly long hours, be large enough to use a detector-radar system, and, most important, a two-man crew to fly it under these varied and difficult circumstances.

After some deliberation, it was agreed that the Bristol Blenheim, originally designed as a medium bomber, might be modified into a two-man night fighter. This two-engined, all-metal monoplane—hardly a winged beauty—was turned into a long-range fighter by simply bolting on four forward-firing machine guns in a pod mounted on the underside of the fuselage. The gunner was accommodated in a power-operated turret behind the wing, which left a vulnerable blind spot behind and beneath the tail where an attacking fighter could neither be seen, nor fired at; but it was a start.

Over the weeks following the outbreak of war, minor improvements were added; a better blind-flying system was installed, a new V.H.F.

(Very High Frequency) radio was introduced, and the air crews were puzzled when the squadron engineers bolted on peculiar, stubby aerials, and what appeared to be barbed arrows that protruded from the strangest places.

"I know what it is," said one gunner confidently. "Notice the shape of them. They're for cutting balloon cables, if we should run into them in the dark."

He, of course, was very wrong. The new impedimenta was connected with a small black box that sprouted knobs and cables, and was mounted amidships inside the aircraft. This strange collection of old iron and plumbing was a radar-detector set.

And with this ungainly aircraft, and a primitive radar device, the Royal Air Force set about stopping Hitler's night raiders.

While not particularly specific, history discloses that the night-fighter crews who roamed the searchlight-slashed skies over Britain were a breed apart. When the daylight phase of the Battle of Britain brought immense losses, Hermann Goering switched to night attacks and sent his heavies direct to London. Destroy London, he decided, and the most valiant Britisher will hoist the white flag.

His losses during these nightly forays were almost as severe as those in broad daylight. How did the R.A.F. do it? During the greater part of the year the sky above England is rarely clear. Seven times out of ten Goering's bombers attacked from rain clouds and sometimes at the height of a storm. What sort of men were they who could pierce this murk and blast his bombers from the sky?

In the first place Britain was blessed with a most efficient anti-aircraft defense, barrage balloons trailing long steel cables, dreadful weather, and several squadrons of Blenheim night fighters. The acknowledged leader of this new breed was Flight Lieutenant John Cunningham, whose true bag will never be accurately known, but Cunningham is listed among Britain's leading aces with a score of twenty-plus victories. In those days he was affectionately known as "Cat's Eyes," a nickname he modestly disclaimed, saying that in a multiplace night fighter, his eyes were the aircraft's radar, and the man who operated that delicate instrument. For the greater part of his war career Cunningham's radar man was Jimmy Rawnsley, who was born in London of Yorkshire parents. Jimmy rose from a lowly

air mechanic to the rank of squadron leader and was awarded three of Britain's highest decorations.

Although Cunningham's modesty is commendable, it should be explained that some of his wartime service was in single-seater Hurricanes, but the latter part of his amazing career was aboard a Bristol Beaufighter, an adaptation of the former torpedo-carrying Beaufort which also had been converted into a night fighter.

At the outbreak of the war Cunningham was only twenty-two and looked fifteen, but because of four years of flying experience, was among the first selected for this specialized job of night operations. The night fighter, in addition to the normal qualities of single-seater pilots, must have long experience in flying, navigation and a complete knowledge of the terrain over which he will operate.

The British barrage balloons, with their deadly steel cables, were usually up at 7500 feet and the night fighter had to patrol well above that level. At the same time he had to view, or imagine, the full details of the area below to know exactly where he was. Here and there, piercing the darkness, he might see the luminous cones of searchlights sweeping the skies. To add to this bewildering glare, sprays of tracer bullets linked up the various patterns. An airfield below might switch on its lights—or switch them off. The night fighter had to adjust his eyesight to these varied glares or shadows. He had to recognize immediately many lights, interpret their meaning and position. He had to assay their nature and compute the overall situation in a flash.

This condition, of course, was peculiar to the time and affected by the equipment and problems of the London defense area.

But this was not the complete tactical problem. The enemy airplane sped at more than eighty yards a second in three-dimensional space. The sky might be totally dark or it might be bathed in a milky shroud or a deceptive lunar glow. The fighter itself flew at even greater speed. The enemy might appear on the radar screen for an instant and then vanish like a fleeting specter. The target problem had to be decided in a split second, and the defense pilot had to identify with certitude and not attack a friendly aircraft by mistake.

Then came the skilled maneuvering for a favorable position to attack and the eventual chase, once the enemy sensed he was under surveillance. In other words, the co-ordination of all the qualities of

a fighter had to be welded under conditions infinitely more difficult than those of daylight combat.

Young John Cunningham played a dual role in the service of his country. Not only was he a first-class airman, but he came along when Britain sorely needed a young champion. When he began his personal war against Goering's bombers, he selected a most appropriate time. Britain, and London in particular, needed a morale boost, and Cat's Eyes Cunningham gave it to them. As the leading exponent of the night-fighting art, he was the main cause of Britain's easing her rigid rule *not* to publicize heroic individuals, beyond the bare statement that Flight Lieutenant So-and-So had been honored with this-or-that decoration.

In 1941 Cunningham was perfect for the role. As stated before, he was most youthful in appearance and schoolboyish in manner. He was very photogenic and he co-operated with all publicity media if he thought it contributed to the public morale. His nocturnal jousting was unusually successful, and as the wearying nights wound on, the British public entered their bomb shelters with more hope for the morning.

"Young Cat's Eyes—that Cunningham kid—will be up there, giving 'em a tanning," they confided as they huddled down for the night.

John Cunningham seldom let them down. Morning after morning, the newspapers reported that "Cat's Eyes" had downed another, and he continued his crusade until Goering admitted defeat and withdrew to realign his forces for the defense of Germany. How much Cunningham contributed to public morale can not be computed, but the fact remains that he not only fought his enemy to a standstill, but he provided a spirit of leadership that is inestimable in such a bitter conflict.

Cunningham was a London boy who had the advantage of being born into aviation—so to speak—since he first saw the light of day in 1917 at Croydon, which became London's first air terminus. He attended nearby Whitgift's School (founded in 1596) where he organized the first model airplane club in the school's history. John stayed with this early love and when he was eighteen he had reached two goals he had set for himself. First, he was a member of the County

of Middlesex Auxiliary R.A.F. Squadron, and second, had procured a job with the de Havilland Aircraft Company. Two years later he had risen to be one of their chief test pilots.

During a 1938 prewar test of a de Havilland aircraft, Cunningham was in the air with the company's chief test pilot, the late Geoffrey de Havilland. Something went adrift and the plane began to disintegrate in mid-air.

"I think that all that remains is to bail out," the chief test pilot said.

"I was getting much the same reaction," young Cunningham replied, and they both went over the side.

Ordinarily, in bailing out from a disabled airplane, a pilot gives most of his attention to ducking the debris, guiding his parachute to a clear landing space, avoiding wooded spreads, high tension lines or built-up areas. As they slowly dropped earthward, de Havilland was amazed to see Cunningham calmly taking motion pictures of the disabled aircraft, thereby gathering much valuable evidence of the manner in which the hulk broke up. His film enabled the engineers to fully diagnose the sequence of structural disintegration.

Cunningham continued his commercial air career after the war. He gained the world's altitude record in a de Havilland Vampire which he flew to 59,446 feet. He has been de Havilland's chief test pilot since 1946 and carried out much of the early testing of the first ill-fated Comet air liner. Today he is continuing tests of the new Comet IV, now seen on many British Empire commercial lines.

Cunningham first came to the attention of a war-weary public one April morning in 1941, after a particularly harrowing raid. It had been quite an evening for "Cat's Eyes" too. It started out as a typically bad night; rain clouds had clotted the skies and the glare of searchlights probing for invaders had not helped the visibility.

Nevertheless, the young Britisher decided to go on the prowl. Before leaving the ground he had spent an hour or so in a dimly lighted room wearing dark glasses. He had Cecil Frederick (Jimmy) Rawnsley with him "on the box" and for some time nothing rewarded their search. They covered a prearranged pattern, sitting it out at the uncomfortable altitude of 25,000 feet. Both were weary, cramped, and unrewarded.

Suddenly, Rawnsley picked up a radar trace of a bomber somewhere. A searchlight blade cut across the sky and in a fraction of a second Cunningham caught what looked like a silver fish. It disappeared as quickly as it had flashed into view. Rawnsley fiddled with the knobs while Cunningham nursed his sight and waited. Gradually, he, not the radar, brought it back into view; the invader was flying level and obviously heading for London. Hoping that the flame traps on his exhausts were operating, Cunningham moved in to get on the bomber's tail. Once there, he eased the throttles up the quadrant.

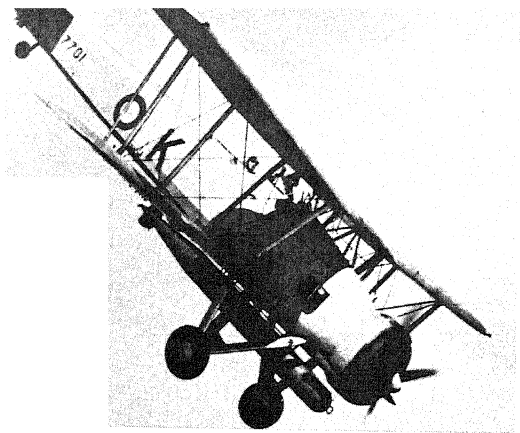
At that instant the clouds began to break and a full moon came up from behind to furnish some unexpected screening. The German pilot made no effort to change course, and by now Cunningham recognized it as a Dornier "Flying Pencil."

"Funny thing," he said later, "until I caught sight of it, I was stiff with cold. I had been wondering whether I was limber enough to use the guns or even work the rudder. The minute it appeared, I was aglow with excitement."

It should be explained that the radar equipment was invaluable in finding an enemy target, but at that time it was not the complete answer to the problem. If a pilot could visually sight the target some time before he was in a position to open fire, he could plan his method and direction of attack more efficiently. It was this unusual vision that accounted for so many of Cunningham's night kills.

The Dornier went on flying peacefully, and with the difference in speeds it would soon be out of range. Cunningham dared not lose sight of it and yet, before making his attack, he wanted to glance over his bank of instruments just to make sure everything was in mechanical order. But that routine check meant risking the momentary glare of the luminous dials. If he allowed his eyes to remain on them, he could lose the night flying vision he had built up over the hours. He remembered that on one occasion he had inadvertently touched the switch that had lighted up a little red light on his dash, and before he could switch it off he was temporarily dazzled and lost sight of his prey.

This time, however, Cunningham risked a glance at the panel. Satisfied that his engines, fuel, guns, and various pressures were cor-

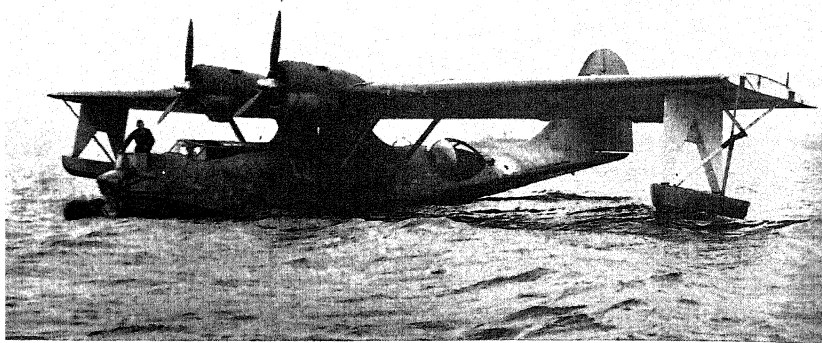


The ancient Fairey Swordfish, affectionately known as the "String Bag," provided some of the most thrilling actions of World War II. It made up the chief striking force of the Fleet Air Arm against the Italian fleet at Taranto, helped sink the *Tirpitz* and was sent against enemy positions in the Norwegian and Low Countries. It was aboard a Swordfish that Lieutenant Commander Eugene Esmond led the small force that so gallantly tried to sink the *Scharnhorst*, *Gneisenau*, and the *Prinz Eugen* when they tried to escape from Brest harbor.

Squadron Leader Roderick A. Learoyd, V.C., British hero who led a flight of Hampdens against the vital aqueduct over the Dortmund-Ems Canal early in 1940. The target was well defended and Learoyd's ancient bomber literally fell apart when he landed.

British Official Photograph





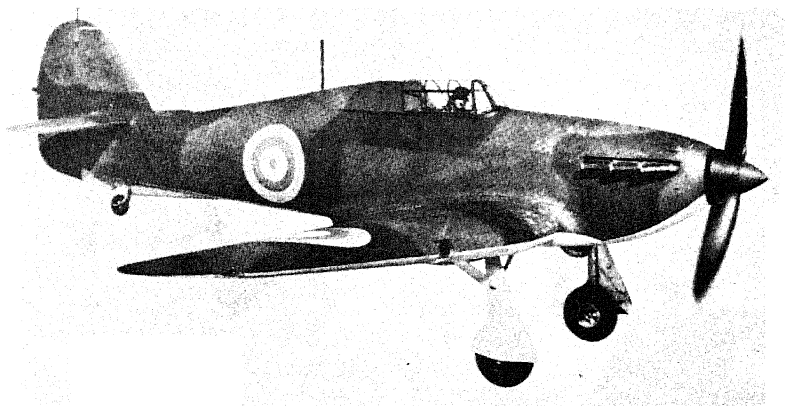
Royal Canadian Air Force Photograph

This Consolidated PBY naval scout bomber played an important role in the antisubmarine warfare program of British, Canadian, and U.S. services. Its history is replete with epic successes, heroic actions, and two Canadians won the Victoria Cross fighting U-boats from the ancient hulls of this American-built amphibian warbird.

Wing Commander Brendan "Paddy" Finucane, Britain's favorite Irishman who destroyed thirty-two enemy aircraft before he himself was shot down. Unlike the traditional fighting Irishman, Finucane was a classic scholar, a poet and turned out much beautiful prose. Here he is seen leaving Buckingham Palace after being awarded two bars to his D.F.C. Later on he won Britain's D.S.O.

British Official Photograph





British Official Photograph

The Hawker Hurricane fighter which played a great part in the defeat of the Luftwaffe bomber force during the Battle of Britain. While not as fast as the Spitfire, it was the first of the eight-gun fighters and very maneuverable, and set a new standard of fighter performance. As the war years progressed the Hurricane underwent many modifications and the type served the British cause well.

Wing Commander Guy Gibson, V.C., leader of the famous Dam Busters, R.A.F. No. 617 Heavy Bomber Squadron which demolished the Ruhr dams, May 16, 1943, considered to be the most daring and successful raid of World War II. Gibson was later killed while flying a Mosquito fighter bomber on a volunteer patrol over Holland.

Topical Press Photograph





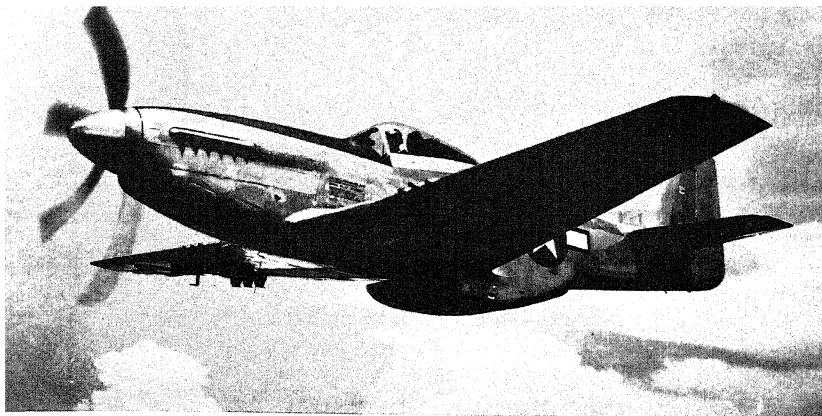
Associated Press Photograph

General James H. "Jimmy" Doolittle who led the first American raid on Tokyo is shown here the winner of the Schneider Cup, famous international air trophy in 1925. For his leadership in the daring Pacific raid, Doolittle was awarded the Congressional Medal of Honor. He later served with distinction in important staff jobs in North Africa and Europe.

Group Captain Douglas R. S. Bader, heroic Royal Air Force pilot who, although handicapped by two artificial legs, shot down twenty enemy planes before being captured after a raid over occupied territory. While a prisoner, Bader made several unsuccessful attempts to escape and became such a nuisance that the Germans threatened to take his artificial legs away.

British Official Photograph





U.S. Air Force Photograph

The P-51 Mustang fighter, a fortunate development of a series of British and American requirements, became the most adaptable fighter of World War II. In its original form it had a range of but 475 miles, but with skillful modifications and varied arrangements of auxiliary tanks, the range was stepped up to 1800 miles. It was the long-range Mustang that eventually provided fighter escort for our daylight bombing operations in Europe.

Group Captain John "Cat's Eyes" Cunningham, Britain's leading night fighter who destroyed more than twenty enemy bombers over London. His youthful persistence and daring, combined with rare night sight, brought him many honors and decorations. Today, he is a test pilot for the De Havilland Aircraft Company.

British Official Photograph

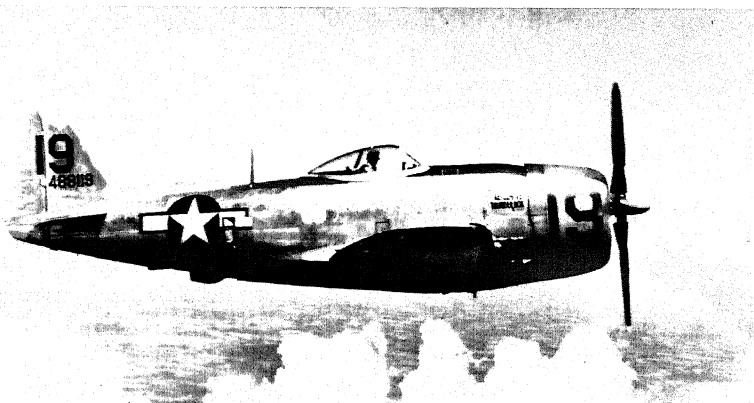




Major General Ivan N. Kozhedub, leading ace of the Soviet Air Force, is credited with 62 victories. Son of a peasant and a product of state flying and technical schools, Kozhedub always claimed that the state of mind was most important in air fighting. He became a general at the age of 30 and has been twice elected a deputy to the Soviet Parliament.

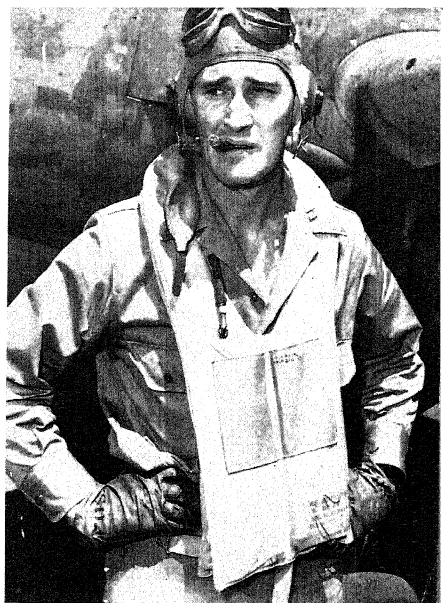
The Republic P-47 Thunderbolt, massive work horse of the U.S. Army Air Force fighter forces. This rough, tough airplane more than held the line during the early months of America's participation in the European war and many noted U.S. aces ran up their scores with this sturdy sky fighter.

U.S. Air Force Photograph



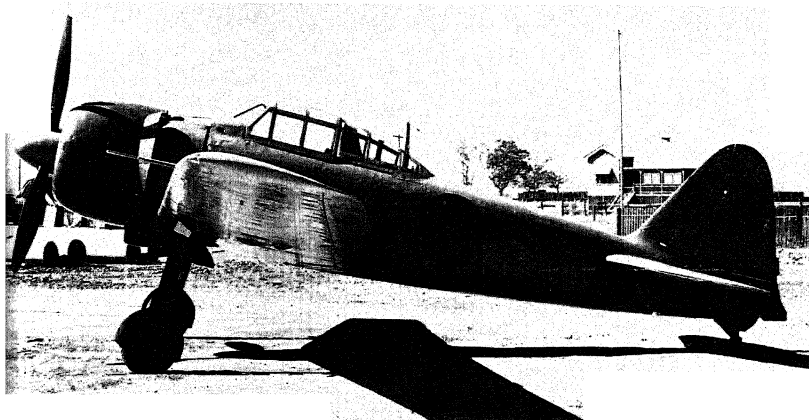
International News Photograph

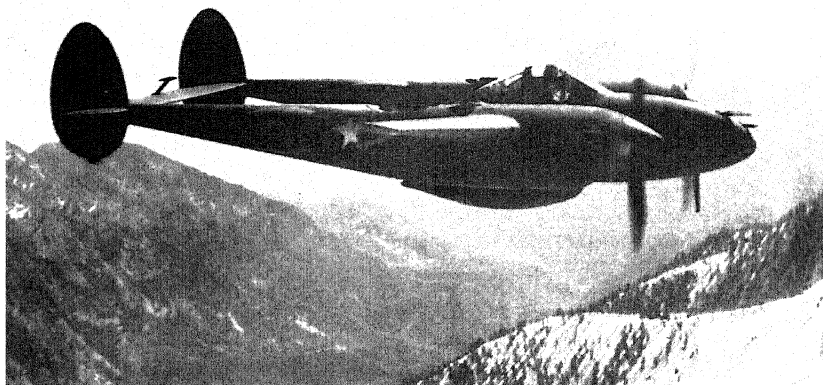
Captain Joe Foss, America's first great ace of World War II. This Marine star ran up his score in the early fighting in the Pacific. He was the first American in that campaign to match Captain Eddie Rickenbacker's World War I record of twenty-six victories. After the war he turned to politics and was twice elected Governor of South Dakota. Recently Foss was appointed president of the new American Professional Football League.



The Japanese Zero fighter, which gave American forces so much trouble in the Pacific campaign. This aircraft, which was turned out in great numbers, was built expressly for that campaign. It was light, maneuverable, and not burdened with a lot of equipment American and British designers deemed necessary. As a result, the Zero could outmaneuver most Allied fighters, and until a new method of attack was devised, in which overpowering gunfire played the major role, it had several months of successful history.

U.S. Air Force Photograph



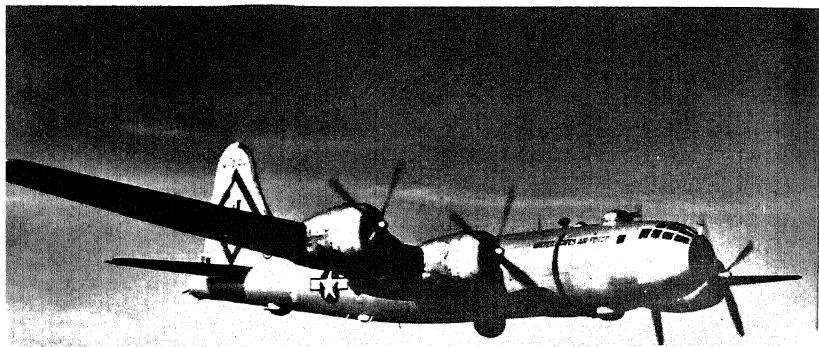


U.S. Air Force Photograph

(ABOVE) The Lockheed P-38 Lightning fighter played an important role in both the European and Pacific theaters of war. It was aboard the P-38 twin-engine fighter that Major Richard Bong and Major Thomas B. McGuire, Jr., put on their memorable contest for the "ace" supremacy of the Pacific. In Europe the Lightning was also adapted for precision fighter-bomber missions.

(BELOW) Boeing B-29 Superfortress, aerial dreadnought which with the atomic bomb eventually brought the Japanese Empire to its knees. Nearly 4000 of these great bombers were built and they dominated the air attack over Japan and Japanese-held territory throughout the Far East. The Superfort's wings spanned 141 feet and she weighed 105,000 pounds. Her top speed was 368 mph and she could bomb enemy targets from a height of 33,000 feet.

Caidin Archives



rect, he returned to scanning the outer darkness. The moon had retreated and now vague shadows made up the backdrop.

The Dornier was still there—it was incredibly near—and Cunningham had to throttle back to avoid collision. He pressed the gun button and his battery of machine guns added their flame to the grim tableau. The first salvo ripped into the German bomber and small festoons of flame ran along the fuselage and over the central escape hatch.

Almost immediately the Dornier broke away, its wings suddenly silvered by the intermittent moonglow. Again Cunningham almost crashed into it and only cleared by a quick flip of his control stick. In the sudden change of direction he lost sight of the bomber and naturally wondered why the enemy gunner had not fired at him. He decided that the Germans were either playing 'possum to escape, or they had been badly hit.

A moment later he spotted the enemy raider below—it was dragging a long plume of smoke.

Cunningham nosed down to make certain the enemy pilot was not resorting to tricks—he'd heard of smoke pots and seen such games before. He dropped from 25,000 to 3000 feet and in the speed of his dive, split a lower panel. The sudden change in cockpit pressure almost burst his eardrums, but he could see that the Dornier was enveloped in small flickering flames.

At 3000 feet the bomber pilot pulled out of his dive and zoomed—probably to give his crew a chance to bail out. Cunningham followed, aimed carefully, and pressed the button again. This time the Flying Pencil wrote itself off; it burst into flames, the wreckage stalled, began to spin, and then went down. Cat's Eyes saw it crash in a country area and set fire to a small thicket.

He was about to circle to note if anyone had escaped by parachute, but he suddenly remembered the balloon barrage, so he shot back for safer altitude and returned to his station.

"My windshield was covered with Dornier oil, proving I must have been foolishly close," he said afterward. "I began to wonder how much damage we had suffered since I had seen pieces of the German wreckage flying all around me. Next, I decided one engine was revving badly, but I only imagined it. After landing, I made out a report, had a bite to eat in the darkness, and took off again."

Cunningham could have called it a night and celebrated, but he selected another Beaufighter and he and Jimmy Rawnsley flew toward London once more. They hadn't been in the air very long before he regretted his hasty decision. The temperature upstairs was worse, and stooging around at 17,000 feet, he knew he had to climb much higher if he hoped to encounter any marauding bombers. It was painfully cold, but he realized that any minute some ground station would be complaining that there were "bandits at Angels-30."

Suddenly, without benefit of their radar, Cunningham spotted a Heinkel. It was directly behind him. His fighter-pilot days had enabled him to turn his head at almost 180°—a very valuable trick. Considering its position, Cat's Eyes was certain the enemy bomber had been following him! But how long? He wondered whether the German had just moved into that position, or whether he had decided to follow this sleepy Beaufighter pilot all the way to London and use him as a stooge.

The situation enraged the young Englishman. Like a wraith, he whipped the Beaufighter over into a tight climbing turn, and worked at it until he was on the bomber's tail. The Heinkel gunner opened fire at 350 yards and Cunningham saw the tracer bullets as they arched toward him. He took evasive action, taunted the gunner with careful zigzags and then suddenly whipped into an attack position and fired a short burst.

It had no effect. The Heinkel continued on its way and the gunner opened fire again. Once more the hissing tracers spat at him, so Cunningham decided that this cat-and-mouse business was ridiculous. He dove sharply on the marauder, with all guns roaring.

Almost immediately a parachute unfolded and then a second one. He realized he had caused some damage, at least enough to justify taking to the silk. He watched the situation carefully, saw the bomber lose altitude and nose down toward the sea. As he continued the chase he realized that both the pilot and a gunner were still with the stricken airplane. But was it really in trouble? Cunningham made three more passes but the two occupants remained aboard, and although smoke trailed from one engine he fired several more bursts until he had expended his ammunition. Still the valiant Heinkel held its course.

Now both engines were smoking and the bomber was still losing

height. He continued to follow it down, wondering what was keeping it under control—and probably cursing his marksmanship. In the varied tones and glares of the night, he lost it and then caught it again as it passed over what seemed to be a black smudge on the surface of the sea.

The black smudge was a vessel that later reported the Heinkel had crashed into the water.

John Cunningham was awarded the Distinguished Service Order for that night's work; he had already shot down ten enemy aircraft and won the Distinguished Flying Cross. He went on to the rank of group captain and the leader of Britain's night fighters.

As the weeks passed, these nocturnal warriors became more active and better organized; they devised secret formations and set up team attacks that completely bewildered the raiders, and Cunningham contributed much personal experience and advice to this planning.

During one night battle Cunningham actually scored a confirmed victory without firing a shot. He had no ammunition left when Jimmy Rawnsley picked up a German bomber trying to get back home, so he made a fake attack and continued to dive on the enemy airplane with such ferocity and determination that the German pilot lowered his landing gear in a sign of surrender and dived to the ground. But the unfortunate victim was so terrified that he did not pull out in time and his machine was completely wrecked.

Night flying over the weeks and months was nerve-racking, and for a time John Cunningham was taken off flying and burdened with a staff job. Although he was not too happy flying a desk, contrary to the blustering hero of popular fiction, he accepted the assignment graciously and strove constantly to perfect the night fighting squadrons and broaden their training. It would be difficult to say which of his efforts was more rewarding; actual flying, or intelligent planning.

Technical progress in the field of radar permitted more precise guidance of fighters against enemy targets, and the actual silhouette of an enemy aircraft could be reproduced on the British radar screen. Ground radar also was greatly improved, and as the night fighters moved about in the black sky they were taken in charge by one ground station after another. These listening posts constantly informed them of the position and the course of the enemy, and the information included the dangers existing in every sector. All these

improvements facilitated and at the same time, complicated the task of the night fighter, but at the moment of the actual attack nothing could replace the spirit of decision, the maneuvering skill, and the cat's eyes of the pilot.

Early in 1943 Cunningham left his staff desk to take over Number 85 Squadron which was then flying de Havilland Mosquito two-seater night fighters. He took Rawnsley with him, and once these two returned to action, they proved that they had lost none of their old skill and daring. Cunningham shot down his twentieth enemy aircraft on January 2, 1944, and a short time later received a second bar to his D.S.O.

It must not be presumed that the Germans had ignored the possibility of night fighting. Far from it. When German troops invaded Denmark and Norway in April of 1940 Hitler tried to prevent the British from interfering, and at the same time protect his northern flank. His air squadrons stationed in Denmark covered the troop movements that preceded the invasion of Norway, and the R.A.F. attempted to disrupt this action by constant day and night attacks. At the time there was a Messerschmitt 110 squadron, under a Major Falk, stationed at Aalborg, and in their daylight operations these fast two-engined fighters had been very successful over the Channel against slower British Wellingtons and Bristol Blenheims.

But now the British were taking night-flying seriously—more seriously than any of the other belligerents, and their night operations were playing hob with the opposition.

Major Falk, for one, sensed that the Luftwaffe fighters would have to learn to night-fly if they were going to stop the British. One or two of his pilots suggested that they be permitted to experiment and try to intercept their enemy. Falk agreed and selected several of his best men to work out the problem themselves. Thus far, none of his Messerschmitt 110 crews had been off the ground at night.

After a short period of after-dark training, Oberleutnant Streib and Leutnant Mölders went out on the tarmac for a test venture; their Fluko (Air Reporting Center) had reported that several bombers were moving in singly from the North Sea. Streib was the first to get his mount to the runway. Mölders followed suit and both of them were off long before they had used up the flare path, but unfortu-

nately the British bombers had been recalled and there was nothing aloft to shoot at.

Neither Streib nor Mölders was impressed by the experiment, and from their half-blind experiences in the air thought that the chance of shooting down enemy planes at night was very remote. Falk continued to question them both and when he learned that neither had had any difficulty in keeping his plane on even keel, he decided to continue the training. He worked out a new plan of blind-flying, although few of his men were very interested. In fact, some of his pilots asked to be relieved of flying, because they did not feel capable of flying high-speed fighters at night.

A short time later Falk's squadron was transferred to Gütersloh for a period of blind-flying with a view to night flying missions. Their aircraft were equipped only for this, for German radar was not yet compact enough to use aboard fighting aircraft.

On July 20, 1940, a British bomber formation headed for the Ruhr—up till now only Falk had shot down an occasional raider at night, but on this evening a number of new night fighters were sent aloft to protect the Fatherland. Oberleutnant Streib again led the way and after boring his way through a cloud bank at 6000 feet, he came out into the clear and headed toward a flak-spattered zone. Blinding searchlights bounced off muffins of cloud, crisscrossed, and set up a bewildering maze of light and shadow. However, Streib spotted an Armstrong Whitley bomber, a racing ghost etched against the night sky. He dove at full speed on the unsuspecting Britisher, but in his eagerness his first burst went wide. He banked sharply and moved around to find the tail of the bomber and gradually the Ack-W silhouette loomed larger and larger in his sights. Streib tripped his triggers and a long burst swept through the raider, ignited a fuel tank and set the machine ablaze. In the next few seconds the aircraft exploded, and what was left went into an untidy spin.

Two days later Streib caught another Whitley in the night skies and sent it crashing down. Before August was out, a third and a fourth toppled to oblivion. Oberleutnant Streib's name appeared in the Wehrmacht communiqués, and a new air hero was acclaimed. By September 30, 1940, the Goering Staff decided to seriously consider night fighting and the art was subsequently developed on a large scale.

German aviation officials had, as yet, no suitable radar for tracking a target and had to develop aural systems and crews to handle the many unique conditions that arose. Flame traps, or suppressors, had to be devised for their exhaust ports, and working agreements made with antiaircraft gun crews and the men who handled the searchlights. In this latter factor they faced several problems, for as soon as they drew up one set of co-operation plans, the British somehow learned of them and used the same series of colored lights that were intended to shut off the beams, or the barrage of high-altitude shells.

A night-fighter wing composed of two squadrons flying Me 110s was finally established. Contacts were maintained with all German weather stations and some efforts were made to break the British weather codes to ascertain what the incoming or prevailing winds would provide. Each squadron was broken up into two-ship units, and these were dispatched to cover certain sectors whenever a British raid was reported under way. One squadron was located at Venlo in the southeast Netherlands near the German border. The other was at Schleswig, a short distance northeast of Kiel.

A typical program for the German night fighters might be taken from the squadron docket of March 26, 1941. Streib, now a Hauptmann, gave his pilots and their radio men a hurried briefing on a raid that had just been reported by their channel listening posts. The weather was favorable to the defense and it was presumed that the Tommies, as they were called by their German opponents, were obviously heading for the Ruhr—their nearest objective. Two waves of fighters went into action while a third was kept in reserve. The flak stations were notified and ordered to keep their fire below 15,000 feet. The searchlight teams would concentrate their glare on anything moving above that level.

"If you experience flak at about 15,000 feet," Streib warned, "you will fire the day's distress signals and recognition flares."

Among the German pilots selected for this evening's show was Leutnant Wilhelm Johnen, at the time an unknown, who later became one of Germany's greatest night fighters. He generally flew with a radio operator named Hans Risop.

One by one the Messerschmitts raced down the flare path and zoomed into the inky night. A bare twenty minutes later Johnen had reached 17,000 feet and was circling over his particular guide beacon

west of Wessel. The night-blue sky arched above and stars peeped and twinkled. Below spread the red glow of the industrial furnaces and finally the first probing thrusts of the silver-blade searchlights warned of the danger. Here and there lights snapped on and flicked off again. The smooth gray ribbon of the Rhine reflected these lights and made a distinct landmark for the British raiders. The first pathfinder flares dropped, exploded, and bathed the landscape with their ghostly gleam.

With that, the German flak opened and crashed all about the bombers and dozens of searchlights lanced out and began their probing. The box barrage went up, but the raiders continued on, awaiting the colored markers that would be dropped by the pathfinder crews to outline the area of the saturation point. Amid all this, the German ground station reported that Hauptmann Streib had already shot down two Britishers in his area, within eight minutes of his take-off.

The pathfinders had now outlined the harbor installations of Duisburg-Ruhrort and their gay markers hung like Christmas tree ornaments over the target area. They went in in fan-formation at graded heights to confuse the defense. The lead machines were soon caught in the silver beams, and the first bomber was almost immediately bracketed by flak, and it exploded. In minutes, four more were burning and falling like comets.

The night fighters were fascinated by this colorful carnage until their controllers below aroused them with important information.

"Condor 10 from Hawk. Give your fighter recognition signal. Course 130. Keep prescribed altitude. Eighty enemy aircraft over Duisburg. You are being transferred to Wolfsburg. Message ended."

Johnen checked his engines and navigation lights. His wireless man checked with Wolfsburg and the fighter controller there gave orders for them to attack any machine caught in the searchlight beams over 15,000 feet. Johnen swung over through the sable night and roared into the frantic action ahead. As he approached the new target area the searchlights became brighter and brighter. In a few minutes he was practically blinded by the display. Some flak burst below and above him, and one wayward shell exploded like a giant egg not fifty yards ahead.

He screamed at Risop to fire a recognition signal. "Those blasted idiots below are trying to shoot us down!"

Fortunately, another night fighter in the area had been more alert, and the proper sequence of green and white flares marked their level.

Johnen put his Me 110 into a sharp left-hand turn and the next salvo broke well behind them. He then roared into a tripod of searchlight beams and realized that they had trapped a British bomber at about 14,500 feet. It was flying straight on, taking no avoiding action and Johnen decided he'd never have a better chance. His radioman warned the flak operators below and Johnen nosed down from his higher altitude and soon had the bomber in his sights. His air-speed needle crept up to 330 mph and gradually the Britisher grew larger in his sight; he could see clearly the tail unit and the rear gunner's turret.

Just as the Me 110 sped into the glare of the coned searchlights, Johnen pressed the triggers. He was just able to note that his shells were ripping off great slabs of fuselage dural, and then he saw the first flick of flame. As he zoomed to clear, the bomber went up with a roar and rolled over on its back.

It was Johnen's first "kill" and his radioman yelled his approval and reported it to the Wolfsburg ground station. "*Condor 10 to Wolfsburg. A Vickers Wellington shot down.*" The ground station congratulated them and ordered Johnen to stay in the area. "We may get you another," they explained.

In spite of their losses, the British bombers had hit the harbor area hard. There were many fires in the important installations and plenty of scarlet glow from where the silver searchlight beams were sprouting.

Risop suddenly cried, "My god! There's one directly above us!"

Johnen peered through his canopy and could just make out the outline of an enemy aircraft—a miracle contact. The bomber, which was a four-engined type, was totally new to the German pilot and radioman, and was flying fairly high on a northerly course. Johnen gradually poured on the power and maneuvered to get below and behind this silvery raider. Apparently unaware of the German night fighter, the enemy now turned northwesterly on a homeward course. Johnen finally decided that this must be a Short Stirling, a machine capable of carrying a ten-ton bomb load, but he was not well-enough acquainted with its structure to know that it carried a gun turret

below the fuselage, so he continued on as he tried to analyze how to attack this giant machine.

Risop said, "We ought to ease back, take the tail gunner out, and then dip and come up under the main section of the fuselage."

Johnen considered that as he checked the flame that snapped from the four radial engines.

"It's time to fire, sir," Risop pleaded. "He'll spot us in a minute or so."

They were the last words the radioman uttered. Just as the pilot was about to trigger his guns, a sparkling burst snapped from the camouflaged turret underneath the Stirling. The glare of the tracer blinded Johnen, his aircraft was caught in the savage slip stream of the bomber and tossed about like a small wad of paper. It was impossible to bring his guns to bear, and broadside the Me 110 offered an excellent target. The Stirling crew responded fast; bullets lashed through Johnen's cockpit, fuselage, and fuel tanks. In a second the Me 110 was a blazing torch and flames were licking along the floor of the cockpit. One burst grazed Johnen's left leg and ignited a bundle of recognition flares attached to his calf. The cockpit canopy was shot away and when the pilot turned to look at his partner he saw that he had slumped forward lifeless over his radio set.

Johnen faced the prospect of getting out of the hulk while it was falling at high speed. With the first desperate effort he got his wounded leg clear, but the centrifugal force was so strong he was rammed back into the aircraft where he huddled with his hands pressed up to protect his eyes. He realized that he had very little chance of getting out, but after a wild dive of about 9000 feet, the Messerschmitt exploded and Johnen was flung clear with a lot of loose debris. He went down like a colored torch with his clothing on fire and the recognition flares hissing merrily.

As he fell, the cool night air revived him and for a minute or so he half-believed that his parachute was on fire, but his training gradually assured him that the pack had not as yet been opened and so he flailed with his hands to put out the flames that streamed from his bundle of flares and what was left of his coverall. He managed to douse the fire just in time to pull his parachute ring and save himself. Actually, two or three lines of the parachute had been damaged and broken and he had some difficulty in maneuvering the other

shroud lines to obtain a straight descent, but he eventually plopped into the water of a flooded meadow and sank deep in the mud. He struggled to free his pistol and fired a few rounds to attract attention, and some friendly farmers came along and freed him from his unpleasant position.

On August 3, 1941, a young German fighter pilot began his war service in the Kiev sector of the Russian front. At the time General Von Bock was preparing an enormous offensive termed a "fury of movement" designed to encircle and destroy twenty-five Soviet divisions. The German aircraft strafed the lines and the enemy back-area positions and during that hectic action Leutnant Hermann Graf met his first enemy, a Russian fighter, and shot him down. By the time the war had ended Graf had scored 205 confirmed victories.

Today, scarcely anyone has heard of Hermann Graf. We can recall Mölders, Galland, Gollob, Marseille, Hartmann, and Rall. As a matter of fact, most Allied historians have refused to record the victory figures claimed by the German Propaganda Ministry for their air heroes, since most of them were so fantastic and unbelievable. It has always been presumed that they were published to offset the successes of the Allied air forces.

But there can be no doubt concerning Hermann Graf's score. Carping critics may point out that it was run up against Russian airmen and Russian equipment. Be that as it may, this young German air killer stands out as one of the most sympathetic figures in an enemy uniform of World War II.

Graf was a lowly factory worker and began his flying life as a sports-glider pilot before he was accepted for the powered aircraft squadrons. As a result of this preliminary training he became a very skilled airman, but through most of the first two years of the war, he was an instructor, which suited this unique young man.

Hermann Graf had a secret, warm feeling for the French people, and had the occasion arose he might have refused to fly against them. He had developed this affection from his mother who came from a peasant family living near the Swiss border. As a young girl she had worked as a domestic in Paris for several years, and when she returned to Germany to marry a boyhood sweetheart, she spoke better French than German. She devoted most of her attention and love

on Hermann, her youngest son, and in his early years fascinated him with many tales of the glorious capital of France.

But the dice of war fell favorably for Hermann Graf and he did not have to take a direct part in the defeat of France. After a lengthy period of instruction he was sent to Rumania where his logbook showed nothing of importance or interest. At the end of March 1941 he was posted to a fighter squadron that covered the airborne troops sent into Crete, but he saw little air action there, beyond a few diving attacks on the British warships that were evacuating the retreating garrison.

On the Kiev front, Graf was given command of a small fighter element and his amazing war career began. He had been assured that the Russian venture would be fought and won in a few weeks, but on his first patrol over the Russian lines Graf soon realized that Hitler had bitten off quite a mouthful. The Stukas, that his force was covering, took a wicked beating from the Russian antiaircraft guns. It was in this foray that Graf began his long list of victories.

The scene then shifted to the Crimea and Graf's outfit was based in front of Kerch. The weather was very bad and the German troops in inadequate clothing could only maintain their lines of communication, rather than continue their blitz-rush toward Moscow. Graf's unit hung on throughout the following winter, and gradually he increased his score against all types of Russian equipment. On April 30, 1942, the greatest day in his long period of air fighting, he shot down seven Russian aircraft.

His logbook shows only the pertinent facts of his victories. He knocked down thirty enemy airplanes in three weeks, but he did not enlarge on any of the actions; he just gave the date, the type of enemy craft destroyed, and seldom any details of where the fights actually took place. He was not just a death-or-glory Me 109 pilot. His unit was often sent on wild low-flying attacks against enemy strong points, airfields, or troop concentrations and on such occasions he spent hours planning his approach, the details of the first strike, and left no feature unattended before take-off. He also took time to elaborate on the completed mission. The following is an example that occurred during an attack on a Russian airfield near Sevastopol, an assignment that he had argued was not worth the risk involved:

"It was dark when we left our flimsy tents and we all shook hands,

believing none of us would return from this senseless foray. We had had our fill of Russian antiaircraft, for it was maintaining the great tradition of Russian artillery—one of the best in the world.

"The sun rose as we crossed the Black Sea and we could see the Turkish coast as we flew over the Russian lines at 12,000 feet. We were a long way from the shore, but our plan of attack had been well thought out in order to keep losses down to a minimum. The night before, I myself, made a reconnaissance flight over today's route, but at a high altitude.

"We banked and set our course northward. For a few moments we flew in close formation above the sea and with the sun behind us. There was also a light morning mist. I thought of my mother and wondered if I would ever see her again.

"We were now down to about 10,000 feet and making about 300 mph. My automatic weapons were ready for firing. I had my right forefinger on the trigger, my thumb on the top of the joy stick ready to fire my air cannon. The little finger was touching the intercom switch so I was left with two fingers and the palm of my hand with which to fly the aircraft.

"Ahead was the rock I had spotted yesterday and we had to climb rapidly to cross the high cliffs but then went down to ground level. My nerves were at the breaking point and I had to force myself to speak to my formation in a calm voice. "This is it. Good luck!"

"Just ahead I could see the hangars exactly on schedule. Russian soldiers were running in all directions as their antiaircraft guns began to fire. Now we were down to ground level and racing through a storm of tracer bullets. On one of my experiences a short time before we were diving on an airfield at Dnepropetrovsk. The Me 109s of two of my comrades flying just ahead of me exploded in the air. I had to fly through the incandescent debris of these two aircraft and it was a horrible sight. Would this be my fate today?

"I saw five Russian machines on the ground and we fired at them with all our weapons. An antiaircraft battery at the edge of the field picked us up, but in a couple of seconds we had silenced it. I held my breath, realizing we were experiencing the most brutal form of this pitiless war.

"Gradually, I recovered my breath and realized that nothing had happened to me. Now we were in the no man's land between the

airfield and the enemy lines. I glanced at my thermostat to see if a burst had damaged my radiators, but all was well. I zoomed, followed by the others and soon we were back at 12,000 feet, with every man in his place. It was incredible.

"A few hours later we examined the aerial photos taken by a reconnaissance observer. Several of the enemy aircraft were seen in flames and all strong points and gun stations had been hit. But we were all strangely silent, for our nerves had been shaken by this operation."

On July 28, 1942, Von Bock's tanks crossed the Don in a surprise move between Nikoloyevsk and Tsymlyanskaya where they were halted by a battery of new antitank guns. The German commander retreated and decided to try again, with a crossing in front of Stalin-grad.

One of the greatest battles in history had begun.

Herman Graf, who was now a group commander, was in the thick of this campaign and admits he was lucky, but his score mounted and mounted. Berlin had been watching his fantastic record and time after time Goering had pleaded with Hitler to relieve the young ace. When the list reached 180, Hitler had still done nothing, but when the 200-mark had been recorded, Goering took it upon himself to send a telegram to Graf which read: YOU ARE RELIEVED OF YOUR COMMAND AND FORBIDDEN TO FLY AGAIN, UNTIL FURTHER ORDERS. Before this message reached Graf, his score was 202.

The air hero of Stalingrad was retired from the front, and from the sky itself and had to sit out the final phases of the grim defeat. Graf's whole squadron, however, took an important part, while in retirement he checked their worthless victories. The German armies were now in full retreat from Russia, Poland, and Silesia.

Over the weeks and months Graf begged to go back to active service flying, but he was always rebuffed by Goering. Then came the final disaster. During the night of March 23, 1945, Montgomery's troops crossed the Rhine. Two days later General Eisenhower sent eight armies against the heart of Germany. They were spearheaded by 1500 bombers, which were escorted by as many fighters. At this point a rumor ran across Hitler's Germany that Hermann Graf was back in the sky.

It was true. The air hero who had been forbidden to fly disregarded

the order, for he realized that by now there was no one to question his move. On March 29, 1945, Graf, with three members of his old command, took off with four aircraft and charged at a complete American squadron. This was the first time Graf had engaged an English-speaking flying force. In quick time they were surrounded by hordes of U. S. Army Air Force Mustangs and Thunderbolts. Graf torched the first he fired at, and then took on a second which broke up in mid-air. His old skill was missing, however, and he was rusty in maneuvers. Instead of shooting down a third—his 205th—Graf collided with it and together the two combatants twirled down toward the earth. Graf managed to crawl out of the wreckage but could not open his parachute until he was dangerously close to the ground. Fortunately he flopped into a pond, for his lifeguard silk was not fully open when he hit. A stiff breeze was blowing and the billowing canopy acted as a sail and dragged the unconscious flier to a shore line.

When he recovered consciousness he saw two German peasants running toward him; they carried him to the nearest *Krankenhaus*. The German Air Force learned of his unauthorized flight and air collision and issued radio appeals for information as to whether his body had been discovered. The Allied radio picked up these messages; probably the first time they had heard of Wing Commander Hermann Graf, the German ace who had downed more than 200 enemy aircraft.

Graf's Number 52 Squadron mourned its chief as it received inaccurate and conflicting reports as to his whereabouts and condition. Germany was in a state of collapse and communications were severely tangled. Number 52 was now somewhere in Czechoslovakia covering Field Marshal Ferdinand von Schoerner's Panzer divisions. By May 8, the German emissaries signed the unconditional surrender of all German military forces. Article 2 of the preliminary act of capitulation stated: "The German High Command will immediately give orders to all military, naval and air authorities to cease active operations at 23:01 hours, Central European Time, and to remain in the positions occupied at that hour. No ship, vessel or aircraft must be scuttled and no damage whatsoever is to be inflicted on their hulls, their machinery or their equipment."

For the pilots of Number 52 Squadron, encircled in a pocket near Brno, this meant waiting—not touching their aircraft—until the Russians arrived to take them prisoner.

That May morning Graf suddenly reappeared at his squadron. He addressed his astounded companions. "The order for capitulation will not come into force until tonight at 23:01 hours. I have decided that we will not surrender with our aircraft. None of our enemies shall touch the joy sticks of our machines. I am giving the order to destroy all Me 109s remaining with us."

After every aircraft had been burned with the fuel left in its tanks, Graf again addressed the squadron:

"As brothers in arms we have shared our joys, cares, and sorrows. The war is over and lost, but we will not surrender to the Russians; we will surrender to the Americans. We will go together to their lines, fighting our way through, if necessary. From this moment the Graf Squadron will become the Graf Storm Regiment."

As such, the Graf Squadron fought its way through on foot; there were many hot skirmishes with the Russians who attempted to bar their way, but the new Storm Regiment finally arrived in almost complete strength and in good order at the American lines. There Hermann Graf explained his plight and surrendered his squadron to the first U.S. officer he met.

He was not unknown, but his captors were surprised to learn that Graf was still alive. The wing commander, his officers, and men were taken prisoner but treated with respect and consideration. This lasted but ten days, however, and on the eleventh the officer who had accepted the surrender explained that, "The terms of the armistice are imperative. Your unit was in the Russian zone when Germany capitulated and we have to deliver you to the Russians. I am very sorry. Our armored cars will escort you to their lines."

The men of the Graf Storm Regiment fell in line for the last time. Their CO reviewed them and then took his position at their head. The unit set out for the east, marching between two lines of American tanks. Hermann Graf was kept a prisoner in Russia for more than four years.

Today he owns and supervises a factory in Bremen that manufactures portable radios and phonograph equipment.

Late in the spring of 1941 a run-of-the-mill Spitfire pilot, James E. Johnson, participated in an attack on a Heinkel bomber somewhere over the English Channel. Although the enemy aircraft received many long bursts from two Spitters that were making the attack, it escaped and probably reached its base, scared but safe. Johnson was credited with one-half of a "probably damaged" aircraft and was pleased with this small recognition of his effort.

In civilian life Johnson had trained as an engineer and engaged in private flying as a hobby. He also belonged to the Chingford Rugby Club and during one of its matches his right collarbone was broken and improperly set so that the nerves leading to his forearm were imprisoned beneath the bone. This almost ended his active flying service in 1940 when at the height of the Battle of Britain he had to have an operation to relieve the pressure.

"Johnnie" Johnson, who became Group Captain Johnson, was the British Empire's leading ace with thirty-eight accredited victories; all of them scored in the Big League against the best the Germans put up. He was awarded Britain's D.S.O.—and two bars, the D.F.C.—and bar; America's D.F.C., Legion of Merit, and Air Medal; Belgium's Legion of Honor; and France's Croix de Guerre. After the war he served with the U.S.A.F. in the Korean campaign, and later commanded a Sabre-jet wing in Germany. At present he is Deputy Director of Tactical Operations of Britain's Air Ministry.

Few war heroes had a tougher time reaching even the lowest grade in the R.A.F. Although he had taken flying instruction at his own expense and had logged a respectable number of flying hours, the Air Ministry authorities held out little hope for him when he tried to join up; at the time they had more volunteers than they had vacancies in the Volunteer Reserve. Even after Munich, Johnnie's appeal carried little weight. Then someone in the Ministry admitted that there were a few vacancies in the Barrage Balloon squadrons, and would he be interested in this vital part of the national defense?

At that, Johnnie gave up and joined the Leicestershire Yeomanry, a mounted infantry organization that still believed in horses, sabers, and spurs. He wore the uniform for a few weeks and enjoyed himself charging about the countryside on various antiquated maneuvers.

Finally, however, the Air Ministry decided that it needed men with

some pilot training, and Johnnie received the good word to report to a flight-training school in Essex. He does not explain how he dissolved his association with the yeomanry, but he began his primary training with the R.A.F. a short time before Hitler started to march. His early days gave no promise of the greatness that marked his war-time service. Indeed, in his book, *Wing Leader*, Johnson gives the reader very little of his personal exploits, and one must diligently search the pages to find any details of his long list of victories; what is to be found is a record of Johnson's astute appraisal of air-fighting conditions and the rapidly changing methods of combat. He was, and no doubt still is, a genius in handling men in action and his record is illuminated not only by his own actions, but by his ability to conserve men and machines.

Johnson served for a time under the famous legless wing commander, Douglas Bader, and was a member of the same squadron when Bader was knocked down in a collision with an Me 109 over France. No two men were less alike, although their war efforts brought about much the same results. Bader was the brusque bulldog whose headstrong attacks and profane hate of his enemies finally caused his downfall. He could not possibly last long in that daily conflict. In contrast, Johnson thought out every problem and situation. He based every patrol on the type of aircraft he was flying, the various men of his section, and with full consideration of what was to be attacked, and where. He never took inexperienced men into any action they were incapable of handling. None of his work was flashy, but it was well done, and carried out with calm efficiency.

Douglas Bader, who lost both legs in an unauthorized stunting display accident before the war, was so grateful at being accepted as a military pilot when his country needed skilled airmen, that he probably overdid every act and gesture. He drove himself with incredible fury, and his indomitable spirit and vitality exhausted his squadron mates. He had no regard for the physical defects, or the day-end weariness of other men. He flew a Spitfire as though driving a squadron lorry. His mind flicked and ticked like an electronic device, as if to atone for his cumbersome movements. He had no understanding of those who could not keep pace with his wild flying or kaleidoscopic variations of his orders and viewpoints.

But Bader had one great quality as a leader. Any pilot who served

with him, took on his complete contempt for the Nazis and became totally fearless in the air. Bader never considered anything but immediate attack; there was no caution, no careful maneuvering, or application of sound aerial tactics. "If they're in the air, you are supposed to shoot them down," was his argument.

Johnnie Johnson considered the situation more calmly. If he was flying a Spitfire Type-2, his attack would be delivered in such and such a manner. If the plane was a Spit-5, or Spit-9, the plan was made accordingly.

Bader will always be remembered as the legless hero of Britain's flying service, and although he was officially credited with destroying more than twenty enemy aircraft, and was great copy for the London newspapers, much of his story value was built up while he was a prisoner of war. After he had crash-landed, somewhat shaken, near Saint-Omer, he was placed in a military hospital from which he escaped, but was recaptured. When it was learned that one artificial leg had been damaged in that escape, the R.A.F. dropped another one. He made a second escape from Stalag VIII, and was finally secured in the infamous Kolditz camp, where he remained until the end of the war.

A motion picture based on his wild exploits was made, and today Douglas Bader is more widely remembered than any other British wartime airman. Only flying men and a few war correspondents recall Johnnie Johnson. He did not have the color, the swagger, and the bluster of Douglas Bader, but his reserved qualities played a more important part in Britain's success in the air. Both their lives, however, make an interesting study in military personalities.

On Sunday afternoon, December 7, 1941, there was an air of solemn tragedy in the towns and cities all over the United States. The faces of the people had a peaked, numb look as they huddled in small groups, or walked aimlessly along the streets in the coppery gleam of the late afternoon. The lights twinkled here and there, and little swirls of dust danced along the curbs. The gutters were littered with the extra sections of the Sunday newspapers, for everyone was trying to find some explanation for the horror at Pearl Harbor.

But there was nothing there in black and white; just a two-column

front-page story about the Japanese diplomats, Kurusu and Nomura, calling on Secretary of State Cordell Hull with an answer to President Roosevelt's request for an explanation of the Indochina affair.

If two officials of the Japanese government were calling on the Secretary of State in Washington, why this account of war on the radio?

It was still blaring from the murky interiors of taxicabs parked at the sidewalks. The deep bassoon voices of elderly newsboys bellowed the extras—war-scare extras with tourist-picture cuts of tropical islands with palm trees bending over artistically in one corner. Just pictures and bewildering captions, but no news or any explanation of what they already knew and tried to understand. Nothing but the same old headlines:

LINDBERGH REFUSES TO MEET REPORTERS . . . LA
GUARDIA TO PUT CITY ON WAR FOOTING . . . TWO
NAZI DIVISIONS DESTROYED ON MOSCOW FRONT . . .
BRITISH TAKE LATEST ROMMEL TANK THRUST IN
LIBYA . . . PREMIER TOJO SAYS EMPEROR WILL DE-
CLARE WAR . . . COAL BOARD RULES FOR UNION SHOP
IN CAPTIVE MINES

News of the Pearl Harbor attack was still crackling out of a million loud-speakers. Every radio station had pushed aside the scheduled programs, symphonies, round-table discussions, the art of acquiring a green thumb, choir programs from famous edifices, glee clubs, and a plethora of pre-Christmas carol singing. Harassed announcers stumbled over strange names and repeated the same sentence over and over. The inevitable had taken place and stunned a nation that had been on the sidelines for nearly two years.

" . . . it is not known what the full damage amounts to. Communications are badly snarled and we have not been able to confirm a rumor that Japanese forces have landed in the Philippines. The Navy Department is preparing an official statement concerning the sinking of at least one battleship. . . ."

"Battleship?" the man on the street grumbled. "What were the Nips using that can sink an American battleship? As I understand it—something I read in *Reader's Digest*—it takes two or three torpedoes to sink a battleship! They must mean just any kind of naval vessel. Not one of our full-sized warships. No one can sink a battle-

ship with what they can drop from a bomber . . . not a *modern* battleship."

A battleship? There were about ninety-six U.S. naval vessels in Pearl Harbor that bright Sunday morning when the Japanese air armada struck. Eighteen of them were sunk or seriously damaged. There were 394 aircraft of various categories that were available for the island's defense, and of these 316 were blasted out of action. After the raid only one airplane, out of a total of eighty-two at one airfield, was fit to fly.

During the attack there were more than forty explosions in the city of Honolulu that, with the exception of one, were the result of falling U.S. antiaircraft ammunition that was not properly fused by the excited gunners. Those shells did half a million dollars' worth of damage.

The Navy reported 2117 officers and men killed, 960 missing, and 876 wounded. The Marines lost 109 killed and 60 wounded. The Army had 226 men killed and 396 wounded. Of the 2404 military personnel that was lost, nearly half went down with the U.S.S. *Arizona*.

The attack had been readied since late November, but had been skillfully screened by the Japanese troop movements into Thailand and Indochina. Their strategy had been so well guarded that no intelligence operator had learned of the task force movement that had crept from the harbors of Nippon. A portion of this fleet, composed of carriers, and screened by a flotilla of cruisers and destroyers, headed off north and east. It was shielded by a co-operative weather front.

At sunrise on December 7, the sky above Oahu in the Hawaiian Islands was sizzling with enemy planes.

A gaily-flagged luxury liner with a passenger list that was yearning for the golden beaches of Waikiki, steamed into the action area, sublime in the belief that the U. S. Navy was staging a full-scale war game for their especial benefit.

At 7:02 an Army private almost became an international hero. He was on duty before a new aircraft detecting instrument when he reported a large formation of unidentified airplanes somewhere to the north. His superiors figured that the radar man needed more training and no action was taken.

The clock on the Aloha Tower read 7:55 when the first wave of Japanese airplanes swept in from the southeast and made their land-fall over Diamond Head. Roy Vitousek, a young lawyer, was aloft for an early Sunday morning spin in his little private machine. In the Army posts scattered over Oahu, servicemen were wondering what to do on this typical idle Sunday in Hawaii. Life aboard the men-of-war in Pearl Harbor was somnolent and proceeding at an easy tropical pace.

The Japs took a gun-test shot at lawyer Vitousek and punctured some of his wing fabric. He was naturally puzzled by this unfriendly action and decided to go home and make a formal complaint. Robert Tyce, another civilian pilot, was standing on a small field near Honolulu spinning the prop on his machine when a Jap fighter-pilot machine-gunned him. Most people on the island turned over in bed and wished the Navy or Army would select any morning other than a Sunday to beat up the welkin.

The "war games" took in the whole area. Pearl Harbor was soon a shambles. Single-engined bombers attended to Wheeler Field, Hickam Field, Schofield Barracks, Bellows Field, Kaneohe Naval Air Station, and several majestic battleships riding at anchor.

The little yellow men of the Rising Sun who had long been written off as aerial opposition, did a workmanlike job. When they finally went home five battleships, three destroyers, a minelayer and a target vessel had been sunk. Six other first-class ships of the line had been sent to the bottom. What they missed, was obsolete.

The United States was outraged. Government officials and politicians proclaimed the attack a "foul sneak-punch," a "treacherous and unprovoked assault," a "dastardly attack."

The Japanese attack on Pearl Harbor was an outstanding military feat of daring which deserves a special place in history. Such an assault against Hawaii, the Philippines, or Guam was obvious. The possibilities had been talked over, written about in responsible journals, and considered by strategic experts all over the world. The international situation presaged such an attack and there can be no logical excuse why it was not met and parried.

Whether the bombing of Pearl Harbor was intended as a sneak-blow may be a moot question, but there is reason to believe that

the Japanese government had planned to deliver a preliminary ultimatum to this country. This ultimatum was received at the Japanese Embassy in Washington in plenty of time for translation and formal presentation, and there can be no excuse for its not being delivered until after the attack. This was revealed during the war criminal trials in Tokyo.

The Hawaiian Operation, as it was known in Japanese Naval circles, was under the command of Vice-Admiral Tadaichi Nagumo who had twenty-three vessels under his flag, including six aircraft carriers. The Pearl Harbor attack was planned, but no definite time for the assault was set. The signal would be given when the outcome of diplomatic maneuvering, then going on in Washington, could be determined.

Nagumo's task force slipped out of Hitokappu Bay on Etorofu Island as early as November 26, and while it made its way across the northern Pacific, the diplomatic conference in Washington foundered and the Japanese government interpreted this as justification for its next series of steps. By December 2, Admiral Isoroku Yamamoto flashed new orders to Nagumo explaining that the date for a formal declaration of war was fixed for December 8 (Japanese time). Vice-Admiral Nagumo then ordered the task force to increase speed and to prepare for battle. None of this activity was noticed or intercepted and early on the morning of December 8, (Tokyo time) the attacking force reached its destination, approximately two hundred miles north of Oahu Island. At 1:30 A.M. (Tokyo time) the first bombers roared off their carrier decks. At 3:23 A.M. Commander Mitsuo Fuchida, air commander of the attack, sent his aircraft against all important U.S. positions and then radioed to Admiral Nagumo: "WE HAVE SUCCEEDED IN THE SURPRISE ATTACK."

This could be interpreted as evidence that the Japs had intended a surprise, or that Fuchida was so delighted at encountering practically no opposition, he instinctively thought in terms of having staged a surprise assault. But more important, the message became the Japanese declaration of war, for immediately after, Japanese air fleets launched their attacks against Allied installations over a front of thousands of miles.

In order to eliminate American fighter strength and to gain control of the air, twenty-five Val-99s (dive bombers) carried out a screaming

assault against Wheeler Field, the center of U.S. fighter-plane operations in Hawaii. Another group of dive bombers headed for Hickam Field, then a heavy-bomber base. These attacks were so well organized that the few U.S. aircraft that managed to get off the ground were not able to hamper the attackers.

Timed with precision, a force of high-level and torpedo bombers moved against U.S. naval craft anchored in the harbor. Under the leadership of Lieutenant Commander Shigeharu Murata, forty-nine carrier-based attack bombers struck a savage blow against the all-important battleships. Covering the dive bombers, forty-three Zero fighters, led by Lieutenant Commander Shigeru Itaya, went into a low-level strafing sweep against antiaircraft installations, strong points, and ships in the harbor. These fighters also knocked down four American pursuit planes that had managed to leave the ground during the bombing attack.

After more than an hour of devastating bombing, a second wave roared into the combat area, in which 170 aircraft under the command of Lieutenant Commander Shigekazu Shimazaki concentrated on the anchored surface vessels, while another force of Zeros swept all U.S. aircraft out of the sky and then shot up their hangars, barracks and bases.

About 8:30 A.M. (Tokyo time) all aircraft had completed their attacks and had turned back for their respective carriers. The Japanese Naval Air Service had scored what, at the time, was probably the highest rate of accuracy in high-level bombing aircraft attacks, including the use of conventional bombs and aerial torpedoes. In a short period of time, the fighters and bombers of Nagumo's force had learned to fight with seasoned heroism; they had destroyed a major portion of the United States Pacific Fleet, in which operation they lost nine Zero fighters, fifteen Type-99 dive bombers, five Type-97 attack bombers, and fifty-five officers and men.

More amazing, of the 353 aircraft launched by the Nagumo force to attack Pearl Harbor, only 154 were assigned to attack the U.S. warships; the remaining 199 aircraft were dispatched to shoot up and bomb defensive airfields. Whether this success was a fluke, or a treacherous sneak-punch, may be debatable, but shortly after, Admiral Yamamoto issued an order to pursue and destroy the British fleet either at the Singapore Naval Base or on the high seas.

Operating under greater difficulties and hazards, the same naval force did just that—accomplishing a mission no less vital than the attack on Pearl Harbor.

It can always be argued, of course, that had the American forces on Hawaii detected early the approach of the Japanese fighters and bombers and put up an organized defense of fighter planes, the Japanese attack would have been lessened, and their losses increased. It is also conceivable that had Pearl Harbor been properly protected by air defenses, the assault might have lost much of its effectiveness and the history of the Pacific War proportionately altered. But none of these considerations can detract from full appreciation of the Japanese effort. It was a feat that astounded the entire world.

The outbreak of the Pacific War brought the characteristics of a new fighter aircraft to the attention of all aviation officials. This was the Japanese Zero fighter, manufactured by the Mitsubishi company and known technically as the A6M2 Model 21 *Zero-Sen*. For its day, it undoubtedly was one of the finest all-purpose fighters in the world. Its adaptability gave the Japanese Naval Air Service a weapon immeasurably superior to any Allied aircraft then in service in the Pacific, but, as has been pointed out by several aviation experts, this factor of strength became a tragic weakness. Because of the temporary superiority of the Zero fighter, trained pilots remained on active duty for extended periods, and the low initial rate-loss prevented, or hindered the combat training of new pilots.

Nevertheless, while they were doing well in the opening weeks of the Pacific War, the Zero deserved much credit for the early Japanese success. In the Philippines and Dutch East India campaigns, Japanese offensive rested directly on the ability of the Zero fighters to establish control of the air. Neither of these campaigns could have been fought with a fighter plane of lesser performance than the 1941 Zero.

At the outbreak of war Japan's chief land-base air strength rested in Formosa. Clark and Iba Fields on Luzon were 450 nautical miles away. Manila was even farther. If victory was to be achieved here, the American fighter forces would have to be destroyed or grounded.

These distances presented a serious obstacle and exceeded the longest flights the Japs had made so far in the earlier China opera-

tions. There was also the possibility of excessive bomber losses, since the prospective targets appeared to be far beyond the maximum capabilities of Japanese fighter machines.

To give fighter protection, an aircraft was needed that could fly nine hundred miles round trip between Formosa and Luzon. Actually, it was necessary to provide for the equivalent of at least 1300 miles of flight, since the Zeros would be called on to engage in fuel-consuming fighter maneuvers over the targets.

This Formosa-Philippine operation required a Zero force of 250 machines, and practically every seasoned fighter pilot available; an attack formation never before assembled by the Japanese Air Service. This time, there could be no element of surprise, and the Zero fighters knew they must expect opposition and be able to fight after a long flight to reach their targets. It had been planned originally as a strike from three aircraft carriers, but this proved unsatisfactory, and a staff of fighter-plane experts went to Formosa some time prior to the proposed attack to set up new fuel supply systems for the contemporary Zeros and give the pilots new instruction in fuel conservation.

In a short time the endurance range of the Mitsubishi single-seater was stepped up to eleven hours; ample time for an attack on Luzon and enough reserve fuel to return to their land base. Some of the crack Japanese pilots were able to keep a Zero in the air for more than twelve hours, and ten-hour simulated patrols were routine.

For the actual attack on the Philippines the Japs assembled 184 Zero fighters, 192 land-based attack bombers (120 Type-1 and 72 Type-96 aircraft). Twenty-four Type-97 flying boats were added to this armada. The attack was to be carried out simultaneously with the raid on Pearl Harbor, but a thick fog rolled in during the morning of December 8 (Tokyo time) and the planned take-off was impossible. The Japanese airmen impatiently stomped up and down their tarmac for hours, but they could not get away until early in the afternoon. The main force reached Luzon about 1:30 P.M. (Tokyo time) and again, by a quirk of circumstances, the American defense force was caught completely off guard.

After receiving startling reports of the Pearl Harbor attack, American fighters guarding the Philippines took to the air in anticipation of a forthcoming raid. The weather over Luzon was beautiful

and after waiting in vain for several hours, seeking and searching for the expected Japs, the U.S. pilots returned to their bases. When the enemy raiders arrived, practically all defense planes were grounded with their fuel and pilots exhausted. No attack could have been better timed.

Between forty and fifty fighters were immediately destroyed on Clark Field. While the bombers swept up and down blasting hangars, sheds, strong points, fuel dumps, and ammunition stores, the Zeros shot up grounded aircraft or any crews caught trying to start the machines. Two Zero units trapped an estimated fifteen American planes that somehow clambered into the air, and in the ensuing battle every American ship was shot down. Of 160 planes, including thirty-five B-17 Flying Fortress bombers, more than sixty were destroyed.

Two days later, a second attack effectively neutralized the Cavite Naval Base, and in a short time not one U.S. aircraft was in condition to contest the continued attacks by the long-range Zeros. They had complete aerial supremacy in this theater of war. The operation puzzled Allied air experts for months, since no one could understand how this amazing single-seater could fly such distances, fight for long periods over its target, and return to a land base. Few of them believed that the Zeros were not being flown from some unlisted aircraft carrier.

On December 10, 1941, the third day of the Pacific War, the Japanese Air Service scored what was probably its greatest triumph of the campaign. This was the successful air attack on two battleships of the British Fleet in Malayan waters. The destruction of H.M.S. *Repulse* and H.M.S. *Prince of Wales* was accomplished without the aid or participation of any Japanese surface vessels. Seventy-five, twin-engined, land-based attack bombers of the Navy's 22nd Air Flotilla carried out this mission, which rendered Britain's Asiatic sea power even more impotent than that of the U. S. Fleet in Hawaii.

The sinking of these two British dreadnoughts was perhaps more dramatic than the attack on Pearl Harbor, for here the effect was complete and final. Pearl Harbor had been attacked—that the world knew—but the full details of the success were not admitted for many months, whereas the sinking of the *Repulse* and the *Prince of Wales*

was announced immediately by friend and foe. Cecil Brown, a well-known American correspondent, was aboard one of the warships, and his complete story of this naval exploit was broadcast throughout the world. The news was something of a solace in the United States for the wound the U. S. Navy had suffered a very short time before, but it was a shattering blow to Allied seapower in the Pacific.

This loss was another shock to the British public which had scarcely recovered from the evacuation of Dunkirk, the Battle of Britain, and the disasters in Greece and Crete. Two chief ships of the line had been sent to the bottom with the loss of but three Japanese bombers, all of which performed a Kamikaze and crashed into the hulks of the British warships as they went down.

The *Repulse* and the *Prince of Wales* had been rushed to the Indian Ocean area and had arrived at Singapore early in December. The unexpected appearance of these two battleships threatened the Japanese plans for a Malayan invasion, and it was obvious that they would have to be put out of action as quickly as possible. The Japanese Navy had nothing as powerful as either of these two vessels, and an all-out attack from the air was decided as the safest method. With this in mind, Admiral Yamamoto ordered twenty-seven Mitsubishi OB-1 land-based attack bombers to move from South Formosa to a new base in Indochina.

Early in December the Japanese Air Service began patrolling the waters surrounding Indochina, Malaya, and Borneo for the purpose of tracking the two British warships. On December 6 troop transports carrying Japanese Army forces that were scheduled to invade the eastern shores of Malaya, were discovered by British flying-boat patrol bombers. Thus, the invasion plan was exposed long before the Japs were able to put foot on Malaya, but after twenty-four hours of waiting, no British attack was experienced, and all through December 8 nothing turned up to impede the movement of the Japanese troopships. At 5 P.M. the next day a submarine reported, "Two battleships proceeding northward." A short time before, word had been received that both the *Repulse* and the *Prince of Wales* were still sheltered at Singapore; if they had moved out, why had the British admiral taken such a chance.

Yamamoto quickly decided that if these two British ships had steamed out to the high seas, they were a menace to his Malay inva-

sion forces and had to be stopped; but why the British commander would take such a risk without air cover, was most perplexing.

The truth was that Vice-Admiral Sir Tom Phillips had no choice. It was known that a Japanese invasion force was heading for Malaya, and—death or glory—it had to be stopped.

A quick check confirmed the Japanese reports that both warships had left Singapore and by 7:00 P.M. Yamamoto completed all preparations for a full-out torpedo attack. The full force was sent out but succeeded only in finding the *Chokai*, a Japanese heavy cruiser that was almost bombed by mistake.

December 10 brought good weather and visibility and by 6:25 A.M. the reconnaissance planes were sent off on a new search and some time before noon the two British dreadnoughts were sighted some seventy miles southeast of Kuantan, moving on a south-southeast course. At 1:03 P.M. the two dreadnoughts were recognized as the *Prince of Wales* and the *Repulse*, escorted by three destroyers and a small merchant vessel. The full Japanese air assault force moved into battle formation and a new passage of naval air history was written.

The *Repulse* was attacked first; bombs hit her at 12:45 P.M. (area time), the first torpedoes caught her at 1:42 P.M., and the gallant battle cruiser went down at 2:20 P.M. The *Prince of Wales* fought on for some time, putting up a terrific barrage of antiaircraft fire, but a torpedo hit her square at 1:14 P.M. and after another hour and twenty minutes, she finally blew up and sank.

The full statistics on this Japanese attack make interesting reading and provide some thoughtful consideration of naval-air power. Thirty-five torpedo bombers and eight high-level bombers were sent against the *Repulse* and over a period of forty-two minutes, these attackers released more than twenty torpedoes, ten of which exploded against the hull of the hapless vessel. In addition sixteen 550-pound bombs were dropped, of which only one hit the *Repulse* and two fell as near-misses.

The *Prince of Wales* was attacked by fifteen torpedo bombers, and of the fifteen torpedoes released, only eight could be credited as direct hits. One of these damaged an escorting destroyer. Eight high-level bombers dropped fourteen 1100-pound bombs on the battleship, and only two of these were direct hits. Nine other bombers of the

same group dropped eighteen 1100-pound bombs, but none scored even a near-miss.

Much sermonizing flowed from amateur and professional critics over the handling of the prized British warships in these Malayan waters, but none of the hearthstone experts had to bear the responsibility that was Vice-Admiral Phillips'. He could have avoided action with enemy torpedo bombers, and moved out of land-based range, but that would have ignored the over-all situation in Malaya and the possibility of destroying a complete Japanese invasion fleet. Had Phillips caught up with the Japanese Malayan naval force, the situation might have been reversed, for the Japanese naval commander would have faced the task of getting a large slow-moving troopship force to safety, while trying to hold off two majestic battleships manned by a brilliant staff and crews. No vessel available to the Japanese at the time, could have stood up to the gunpower and speed of the British flotilla. As it was, the fates of war refused to cooperate, and it was Phillips who was trapped with no air support to provide the necessary cover. It was a brilliant victory for the Japanese, but an even more glorious stand by the British.

But luck was to turn on the Japanese—luck and the grim courage of a handful of U. S. Marines. On the day following the sinking of the *Repulse* and the *Prince of Wales* the Japanese Navy was subjected to its only defeat in the opening months of the Pacific War. In fact, a new Japanese invasion force was soundly thrashed by small defending forces at Wake Island, which is situated about halfway between Honolulu and the Japanese mainland. Actually, it is a wishbone-shaped atoll of three islands, Wake, Wilkes, and Peale. Jurisdiction of this tiny area passed to the Navy Department in 1934, and the following year Pan American Airways first brought Wake to public notice by choosing it as a stop on its course to the Orient, and a hotel was built to accommodate Wake's overnight flying-boat passengers.

In 1938 the Navy's Hepburn Board recommended that \$7,500,000 be spent on Wake to develop it as an air base for long-range patrol-plane reconnaissance. This work was not started until 1941. The day before the war broke out, there was a force of 38 officers and 486 enlisted men. There was no radar to aid the twelve Grumman

F4F-3s flown by Marine pilots, and the air strip was only wide enough for the planes to take off one at a time.

On December 11, 1941, at 11:58 A.M. Japanese invasion forces under the command of Rear Admiral Sadamichi Kajioka moved to take this important little atoll. A few Marine guns mounted in the sand dunes resisted so valiantly that the cruiser *Yubari* was damaged and the destroyer *Hayate* was sunk. Four Wildcats (F4F-3s) flown by Major Paul A. Putnam, Captains Henry T. Elrod, Herbert C. Freuler, and Frank C. Tharin went up with 100-pound bombs hanging from temporary lugs and dropped these on retreating Japanese destroyers. One struck the stern of the *Kongo Maru*, a medium transport, and the biggest prize was the destroyer *Kisaragi* which blew up about twenty miles offshore. Late that afternoon Lieutenant David D. Klierer attacked and claimed to have sunk a Japanese submarine, but never got official confirmation. After the surrender of the island, the surviving Americans were interrogated at length by the Japanese about a submarine that had failed to turn up after the Wake action.

Rear Admiral Kajioka withdrew his battered fleet to Kwajalein in the Marshall Islands where he could reorganize and plan another assault on the little Marine fortress. Admiral Nagumo, flushed with his success at Pearl Harbor, was ordered to assist in the Wake Island invasion, and on December 15 the Japanese 2nd Carrier Division, escorted by four destroyers, was sent to the area north of Wake Island. Before assembling for the attack, Rear Admiral Hiroaki Abe's 8th Cruiser division with the *Tone* and *Chikuma* joined the force. In the interim, Japanese land-based bombers worked to soften up the island and prepare the way for a landing by their own marines.

The end began on December 21. Dive bombers and Zeros, striking from heavy cloud cover, swept in and set the stage for a beachhead landing. At the time a relief expedition from Pearl Harbor was only 627 miles to the east of Wake, but for various reasons, never made contact with the Japanese force. One authority explains that it was held up for refueling, while another claims that Vice-Admiral William S. Pye, who had relieved Rear Admiral Husband E. Kimmel pending the arrival of Admiral Chester W. Nimitz, could not make up his mind whether to risk what was left of the U. S. Pacific Fleet.

On the night of December 22 (December 21, Pearl Harbor time)

a compromise was effected. A number of F2As would be flown off at maximum range. A seaplane tender-transport, the *Tangier*, would make a speed run into Wake with a force of U. S. Marines while the rest of Task Force 11, built around the aircraft carrier *Lexington*, was assigned to the relief of Wake Island. These orders were countermanded—possibly in the face of the Japanese strength—and all ships turned north or east, leaving the defenders of Wake to shift for themselves.

Reactions varied from astonishment to shame and anger. Many of the pilots aboard the *Saratoga*, which was steaming from Hawaii to the rescue, sat down and cried when they learned that they would not be allowed to succor the beleaguered forces on Wake Island, and some staff officers counseled Rear Admiral Frank Jack Fletcher to disregard orders and make a dash for Wake. They did not know that at the moment of turning back, some four enemy heavy cruisers were patrolling east of Wake and separated from any Japanese carrier air support by hundreds of miles. They would have been sitting ducks for the pilots of the *Saratoga*. Nor could anyone tell them that the Japanese attack force was disposed about Wake with no apparent measures for security against surface attack. Had this intelligence been available, the story of Wake might have been a triumph, instead of a tragedy.

By December 23, two invasion barges had reached the beach on Wilkes Island and in a short time every man of the Marine fighter squadron was killed as he served a gun of some sort. Ten civilians who joined in the fight were soon cut down. A few American officers managed to escape aboard a PBY flying boat and made a full report.

Again, superiority in the air, had overcome human boldness and gallantry. If the handful of Marine Grummans could have been conserved, there might have been a different story, but there were no spare parts, no skilled maintenance men, no radar to conserve time eventually wasted in the air. And the indecision and confusion that followed Pearl Harbor all conspired to the loss of Wake Island.

MILITARY AIRCRAFT OF THE FIGHTING POWERS (1941-42)

UNITED STATES

Single-Seater Fighters

TYPE	ENGINE	TOP SPEED	ARMAMENT
Lockheed P-38	1090 Allison (2)	350	4 Machine Guns
Bell P-39	1150 Allison	400	3 Machine Guns
Curtiss P-40	1000 Allison	360	2 Machine Guns
Republic P-47	2000 P. & W.	400	6 Machine Guns
N. American P-51	1150 Allison	370	8 Machine Guns

Multi-Seat (Night) Fighter

Northrop P-61	2000 P. & W. (2)	360	8 Machine Guns
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Attack Bomber

Douglas A-20-A	1600 Cyclone (2)	320	6 Machine Guns
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Medium Bombers

Martin B-26	1850 P. & W. (2)	326	4 Machine Guns
N. American B-25	1700 Cyclone (2)	300	4 Machine Guns

Heavy Bombers

Boeing B-17	1100 Cyclone (4)	305	7 Machine Guns
Consolidated B-24	1200 P. & W. (4)	280	12 Machine Guns
Douglas B-19	1700 Cyclone (4)	209	6 Machine Guns
Lockheed B-34	1200 P. & W. (2)	275	6 Machine Guns

NAVAL AIRCRAFT

Fighters (Shipboard)

Grumman F4F-3	1200 P. & W.	330	6 Machine Guns
Vought F4U-1	1850 P. & W.	366	6 Machine Guns

Divebombers

Curtiss SB2C-1	1750 Cyclone	250	3 Machine Guns
Douglas SBD-3	1750 Cyclone	230	3 Machine Guns
Vultee A-35	1700 Cyclone	300	3 Machine Guns

Patrol Bombers

TYPE	ENGINE	TOP SPEED	ARMAMENT
Consolidated PBV-5	1200 P. & W. (2)	190	3 Machine Guns
Consolidated PB2Y-3	1200 P. & W. (4)	226	4 Machine Guns
Martin PBM-1	2000 Cyclone (2)	225	6 Machine Guns

Scout Observation

Curtiss SO3C-1	520 Ranger	200	3 Machine Guns
Vought OS2U-3	450 P. & W.	171	2 Machine Guns

Torpedo Bomber

Douglas TBD-1	825 P. & W.	225	2 Machine Guns
Grumman TBF-1	1600 Cyclone	270	3 Machine Guns

Scout Bomber

Vought SB2U-3	750 P. & W.	275	3 Machine Guns
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(These details and performance figures are those applying to the original accepted models. In practically all cases these aircraft were modified, improved or provided with more powerful engines and given varied or increased armament as the war progressed and combat conditions changed.)

JAPAN

Single-Seater Fighters

Mitsubishi S-00 (Zero)	1200 Kinsei	345	4 Machine Guns
Nakajima S-97	750 Nakajima	270	3 Machine Guns
Mitsubishi S-97	650 Mitsubishi	265	4 Machine Guns
Kawasaki S-97	850 Kawasaki	290	4 Machine Guns
Kawasaki S-98	820 Kawasaki	270	4 Machine Guns

Fighter Bomber

Showa SB-99	850 Showa	220	5 Machine Guns
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Reconnaissance Bombers

Kawasaki KB-97	900 Kawasaki	236	2 Machine Guns
Mitsubishi KB-98	900 Kinsei	250	4 Machine Guns

Heavy Bombers

Mitsubishi OB-97	1000 Kinsei (2)	220	7 Machine Guns
Mitsubishi OB-98	750 Mitsubishi (2)	220	5 Machine Guns
Kawasaki OB-97	820 Kawasaki (2)	245	9 Machine Guns

NAVAL AIRCRAFT

Fighters

TYPE	ENGINE	TOP SPEED	ARMAMENT
Mitsubishi S-97	650 Mitsubishi	265	2 Machine Guns
Mitsubishi S-97 (3)	650 Mitsubishi	265	2 Machine Guns
Mitsubishi S-96	730 Kinsei	250	2 Machine Guns
Nakajima SKT-97	750 Nakajima	320	4 Machine Guns

Divebombers

Aichi K-99	900 Aichi	250	4 Machine Guns
Mitsubishi K-96	730 Kinsei	200	3 Machine Guns

Bomber-Torpedo Planes

Kawanishi G-97	650 Kawanishi	155	2 Machine Guns
Mitsubishi G-97-1	900 Kinsei	195	3 Machine Guns
Nakajima G-96	600 Kotubuki	168	1 Machine Gun

Heavy Bomber

Mitsubishi OB-96	1000 Kinsei (2)	230	10 Machine Guns
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Reconnaissance Seaplanes

Nakajima KT-95	600 Kotubuki (2)	160	2 Machine Guns
Aichi KT-98	770 Aichi (3)	230	6 Machine Guns
Kawanishi KT-94	600 Hiro	140	2 Machine Guns

Reconnaissance Flying Boats

Aichi KT-98	500 Aichi	121	2 Machine Guns
Kawanishi H-97	900 Kinsei (4)	215	4 Machine Guns
Kiro H-97	720 Hisso (4)	208	4 Machine Guns
Mitsubishi H-96	900 Mitsubishi (3)	145	6 Machine Guns

(There was no single Kamikaze type of aircraft used for suicide attacks against Allied naval targets. The term means "Divine Wind," a tribute to a legendary storm that once came up to disperse an enemy fleet bent on invading Japan, far back in its early history. Practically every available type from the noted Zero to almost-obsolete naval aircraft were employed in these frenzied efforts to win the war.)

[1942]

GLOOM, despair, and frustration made up the lot of the British Empire and the United States when the doleful bells rang in the new year of 1942. The Pacific, in particular, shuddered with bad news. Simultaneously with the attack on the American bases, there came a carefully co-ordinated assault on British outposts in the Orient. This was part of Japan's idea of a "co-prosperity sphere" in Asia. The fabulous port of Hong Kong, which, along with Singapore and Manila, had been an important point in a triangle of Anglo-American power in the Orient, went down first. As early as 1940 the Japanese occupation of Canton had made it almost indefensible, and the island city fell after two weeks of siege.

Penang and Singapore were next—more than 200,000 specially trained jungle fighters swarmed down the Malay Peninsula and fought their way to the Gibraltar of the Pacific. This time the British were able to send in reinforcements of Australians, Indians, and several crack regiments newly arrived from England. They reached Singapore just in time to be swallowed up or wiped out in the debacle.

Important sections of the Netherlands Indies were invaded and captured. After securing a foothold on Celebes, the Japanese troops marched to the east and landed on New Guinea, New Britain, and Kavieng in New Ireland, winning strategic bases along the eastern perimeter of the East Indies. They were halted temporarily in their efforts to drive a wedge through the center, when an Allied naval force smashed a large convoy in Makassar Strait and destroyed one-third of the enemy transports.

But the Japanese moved successfully southward and captured more strategic points on Borneo and Celebes. They established airfields within bomber range of Surabaya and continued to mop up Dutch forces on Sumatra, Borneo, and Celebes. At this point a small American-Dutch naval force attempted to break the Japanese ring around Java by challenging a large convoy of Japanese troopships that were escorted by strong naval detachments. After a two-day running fight in the Java Sea, the Allied force was practically destroyed; a staggering setback that sealed the doom of Java. Batavia fell on March 5, and two days later the defenses of Bandung were overrun. By March 10, Surabaya surrendered and all resistance on Java ceased. The Japanese claimed to have captured 98,000 prisoners, some five thousand of which were Americans, British, and Australians.

Five weeks after the Pearl Harbor attack, the Japanese realized that the British were not able to mass enough infantry power to exploit their position in Burma—which had been a threat to the Japanese flank in Malaya—so they turned the bulk of their reserve divisions in Thailand against Burma. The British regulars fought with skill and courage, but the colonial levies and native troops were no match for the superior jungle fighting Japs. Two converging forces pierced the British defense line on the Salween and occupied Rangoon on March 8.

The loss of Rangoon finally broke the Allied hold on the Burma Road over which the major portion of supplies to China had moved. The Chinese had begged previously to take part in the actual defense of Burma, but were ignored. Now they were allowed to share in the fighting, but the delay was fatal; the liaison and communications between the British and Chinese were inadequate. The Japanese moved swiftly, exploited this chaotic situation, and soon reached the terminus of the Burma Road at Lashio. Another force captured Mandalay and the British were forced to retreat into India.

When America reversed her hands-off policy in regard to China and committed herself to lend-lease in 1941, the Burma Road became vitally important. After the first few tons a day began to move into southwest China, it was obvious that this highway was worth protecting. At this point some two hundred tall, drawling men, who called themselves the First American Volunteer Group, turned up to fly a number of antiquated P-40 fighter airplanes. They said they

were commanded by a man named Claire Chennault. They were pilots, mechanics, and communications specialists from the U. S. Army Air Force, the Marine Corps, and the Navy. They had come to defend the Burma Road, to fly for China, and to fight the Japanese, if necessary. They were mercenary air fighters, a Foreign Legion of the air, and destined to end their careers in a foul tangle of red tape and unsympathetic bureaucracy.

With thousands of military planes at its disposal, the Japanese Air Force had for years been using China as a general target to test its bombing and ground gunnery. The Chinese had no aircraft or guns to defend themselves, so the Japs flew where they wished and bombed whatever they wanted to. They devastated small cities, blasted small schools, gunned and frag-bombed well-marked hospitals, and seemed to take special delight in raking over the rice paddies, leaving dozens of Chinese farmers spread-eagled in the muddy ditches.

That was how it was until Claire Chennault's Flying Tigers came along. A gaudy daub-up of a tiger shark was painted over the noses of their P-40s to fill in the impression. As time went by, they learned that the Japanese inherently feared the shark as a token of evil, while the Chinese looked on the saber-toothed tiger of Fukien as their national symbol.

Claire Chennault, who was a massive, soft-spoken man, a deep-thinker, almost a solemn schoolteacher-type, was a retired U. S. Army Air Corps captain. He had planned this volunteer group to carry out his ideals and to provide an outlet for his advanced ideas of aviation tactics. He had loved China for many years and had dreamed of driving the Japanese barbarians from her soil. In addition, Chennault was something of a rebel, in the class of the Italian Giulio Douhet, or his own countryman, General Billy Mitchell. Chennault had long fostered the theory that the fighter plane was the key to successful bombing, and had pointed out that fighters played havoc with bombers in the First World War; but this doctrine had been almost discarded when it seemed that the fighter was on its way out.

Chennault inherited this rebellious nature. On his mother's side of the family was Sam Houston of Texas, and his father's family tree included another outstanding rebel, Robert E. Lee.

When he was forty-seven and still only a captain, for he per-

sisted in flouting the Air Force Tactical Training School's doctrine, he was retired as physically unfit for flying duty. He was slightly deaf as a result of many years' flying in an open-cockpit airplane, although later it was said that Chennault could hear a whisper breathed ten feet in front of a roaring aircraft prop. At any rate he could certainly hear anything he wished to.

On his retirement Madame Chiang Kai-shek persuaded him to train and organize the Chinese Air Force. At last he had the opportunity to put his ideas into effect in a shooting war. In the months that followed, Claire Chennault probably accounted for more than thirty enemy aircraft, but he refused to record his own score.

His American Volunteer Group officially destroyed 299 Japanese airplanes between December 18, 1941, and July 4, 1942. This figure represents only those aircraft that were confirmed by outside sources, and on this total the Chinese government paid five hundred dollars per plane to the individual pilots; but scattered through the jungles, mountains, and waters of Southeast Asia, undiscovered and unconfirmed, were about three hundred other Japanese planes that fell before the guns of the Flying Tigers. Friendly historians made a conservative estimate of fifteen hundred Japanese airmen—pilots, navigators, gunners, and bombers—shot down by the A.V.G.

Against these figures the Group lost eight pilots killed in action, two pilots and one crew chief lost on the ground as the result of enemy bombing, and four pilots missing in action. Nine other Flying Tigers were killed in flying accidents during flight training, gunnery practice, or while ferrying aircraft from Africa to China.

Chennault's A.V.G. never had more than forty-nine combat planes available for missions, nor more than seventy pilots capable of flying them. This slender strength was never concentrated at any one point, but was divided among at least three bases. Through Chennault's imagination, experience and tactical genius, the A.V.G. over those amazing six months made history that reads like legend.

This idyllic situation could not continue. The volunteers were of inestimable value to the cause in southeastern Asia which the Japs were overrunning, but back in Washington there was a military induction bill to consider, and the thought that loyal, but free, groups of young Americans were winning high praise and international

accord for their exploits against the Japs when everyone else seemed to be taking a beating, could not long be held.

Chennault was to be given a brigadier general's star and the rest of his flying force offered commissions as majors and captains in the U. S. Army Air Force. Meanwhile a complete combat group was to be organized and sent out to take over the Flying Tigers' area. Few of the Tigers showed much interest in the Washington proposition, and General "Vinegar Joe" Stilwell, who had no concept of air power, was of little help at this important juncture. Next, Colonel Clayton L. Bissell, who had replaced Chennault as chief of pursuit training at the Tactical Training School at Maxwell Field, arrived from Washington to arrange for the induction of the Tigers. This was an unfortunate affair, for Bissell, who had been an ace in Number 48 U. S. Aero Squadron in World War I, is said to have made a pompous, arrogant speech and presented the government plans in an obnoxious manner. Now the Flying Tigers were not being asked to transfer into the regular establishment of the U. S. Army Air Force; they were being told.

Chennault tried to smooth matters over, but the A.V.G. boys sensed that they were being lured back into what they had tried to avoid. They were perfectly satisfied fighting for China and resented being forced to transfer. One by one they answered, "No!" to the Induction Board.

But the end came on June 28, when General Stilwell announced at a press conference in Chungking that General Chennault would command a controversial China Air Task Force. Everyone in the A.V.G. knew it would happen and that eventually they would have to bow to the edict. They needed more new planes, more equipment, and a more stable organization. As a war correspondent said when the changeover was made, "You Tigers have done a terrific job. Nobody can ever take that away from you. But the game is over, now the work begins."

But it was not all gloom in Europe. In January 1942 the Soviet forces were on the offensive all along a snowbound battlefield that stretched for 2000 miles. Hitler had grossly underestimated the power of the Red Army and his Panzer and infantry forces were not equipped for such a winter campaign. His tanks stalled in the first

snows while those of the Soviet were properly winterized and proved most adaptable for winter fighting.

The resulting German retreat was not exactly a rout, but a deliberate withdrawal to a winter line. They held what ground they had taken with a system of "hedgehog" defenses that were supplied by a railroad network from the rear. This hedgehog system eventually absorbed much of the Russian attack and the power of the Soviet offensive ground to a halt. By summer of 1942 Hitler was ready for a new move; his objective was the Caucasus whose rich oil fields produced more than 80 per cent of Russia's total output of crude oil. The Germans had overrun Kerch by May 23, and two weeks later set the stage for a terrific assault on Sevastopol.

Once again there was a grave mood of despair in Allied headquarters. No one knew how soon another great supply area would fall to the Nazi invaders.

About this time the name of Ivan Kozhedub was being heard along the German-Russian line. A new aviation hero, a man who startled the Germans with his dash and tenacity, but who, like so many in that campaign, was scarcely remembered when the war was over.

Ivan Kozhedub could have been a picturesque character in a child's illustrated book. He was born in Oblasheveka, a small village in the Ukraine where the peasants spoke a mixed dialect which included little Russian. His father worked in a factory some miles away, and the family had been very poor for years.

Like the little boys in the story books, Ivan cut faggots and hauled them home on a sledge for the fire. He taught himself to read by studying the labels on cans and grocery boxes in shop windows. He had little formal schooling as he was put to work early helping a shepherd in a nearby village. In the fields he would scrawl pictures of flowers and ferns, and had his life been untrammelled by war, he might have become a famous painter. A man named Melychok saw a future for the boy and exhibited his little pictures in the village library, and it was he who taught Ivan to acquire a visual memory and to develop a sense of observation.

In his youth Kozhedub made friends with other young men who were interested in a flying club, which was part of the new Soviet mass training effort. After some general experience and avid reading

of all available aviation books, Ivan applied for entrance in a government flying school, and was accepted in January 1938.

The doors were open to practically every career for young Russians who were ambitious and eager to learn. Kozhedub had native intelligence, a sharp memory and, more important, a strong will. His physical strength was outstanding and he passed the first stage of his flight training with no difficulty.

Early in 1940 he was admitted to a fighter school where he was such a good flier, he was eventually made an instructor. In this capacity he developed his own military capabilities, adjusting to the quirks and mental processes of his many pupils. He also perfected his own flying. When Germany attacked Russia, Ivan Kozhedub was still an instructor and was not sent to a front-line squadron until 1942 when he was assigned to a Lavochkin fighter squadron.

Instead of instructing, he had to learn the new art of formation flying and on his first actual war patrol he came upon a number of Me 109s that were dropping light fragmentation bombs on his own airfield. These machines were being used as a form of light dive bomber on the Russian front.

Kozhedub's display on this occasion in no way foretold his future greatness. He shot down one Me 109, but from then on he did everything wrong and wound up in front of four German fighters that shot his aircraft to junk. He was lucky to make a safe landing on his own field.

"Oh, I lost my head. I became so excited," he explained. "I failed to act properly. I couldn't calculate in any way and I seemed to lose my enthusiasm. You must have enthusiasm, for it excites the mind and keeps you alert. It also prevents a pilot from expending his energy."

The workers on the collective farms in Russia devoted their savings to the purchase of new aircraft for their particular heroes of the Air Force. Kozhedub was presented with a Lavochkin LA-5 by a collective farm near Stalingrad, and with this improved aircraft, he shot down twenty enemy airplanes. During the Battle of Berlin he noticed a German Me 262 type flying some distance away. He immediately gave chase, fired a short burst, and saw the Messerschmitt go down vertically and crash. This aircraft was the only German turbojet machine to be shot down by a Soviet fighter.

During his operational service Major General Ivan Kozhedub made 330 war patrols and engaged in 120 air combats. He was never wounded, and by the time the Russians captured Berlin, his victory list had reached a total of 62. It must be explained that if this figure seems abnormally high compared to the 38 credited to Britain's Johnnie Johnson and the 40 destroyed by America's Richard Bong, the Russian system of evaluating their successes was not as strict or reliable as that insisted upon by the R.A.F. and the U.S.A.F. But whatever the value of these Russian claims, there can be no doubt that Kozhedub distinguished himself in battle and today is still a pilot of rare caliber.

On February 4, 1944, he was made a Hero of the Soviet Union and a few days later received the Gold Star. By May of that year he had officially destroyed forty-five enemy aircraft and received three Gold Stars. After the war he was elected twice as a deputy in the Parliament of the U.S.S.R., and in 1950 was appointed Guards Major General of Aviation at the age of thirty; the youngest general in the history of the Soviet Union.

Next in rank to Kozhedub, is Alexander Ivanovich Pokryshkin—now a guards major general—with fifty-nine victories. This Russian hero began his working life as a locksmith, and the intricacies of his profession crept into his theories of aviation. He started flying at the Krasnodar Aero Club in Kuban, and was commissioned in the Soviet Air Force in 1932. Almost immediately he began to write a learned book on fighter tactics. It started as a simple album which gave graphic descriptions of every type of air maneuver possible with contemporary aircraft. He studied spins, inverted spins, loops, rolls and many other maneuvers that he worked out on paper and tried to reproduce in the air.

Pokryshkin shot down his first enemy plane on the day the war with Germany began, and as a result became one of the first national heroes. He was soon flying all advanced types, including the Polikarpov I-16, the U.S. Airacobra, and the Yak.

Some of Pokryshkin's greatest exploits were carried out in conjunction with tank units led by General Lelyushenko. The Germans had established two large airfields near the small town of Jüterbog, south of Berlin, and one of these which was the nerve center of German fighter units of Home Defense with many aircraft, hangars,

armament and fuel dumps; presented a tempting target. When Lelyushenko brought in his tanks, Pokryshkin circled the area and machine-gunned German troops and tanks so effectively that they hoisted white flags. With that, Pokryshkin landed his airplane on the German field and, accompanied by Guards Captain Trud, ordered the enemy to march into the Soviet lines.

Later that day two formations of fighters led by Pokryshkin, who was then a colonel, flew on a mission and engaged a formation of enemy aircraft. The colonel was forced to break off the engagement when a cartridge fouled his machine gun, while he was firing. He retired long enough to repair the damage—according to the Soviet report—and then returned to the fray and eased himself out of a difficult situation.

Why the failure of one machine gun should cause such a “serious” situation is not clear, but so reads the official report of Pokryshkin’s wartime career. In that time he flew 360 missions and took part in 156 air combats. Today he is commander in chief of the Russian Fighter Command.

One of Pokryshkin’s squadron mates was Dmitri B. Glinka, who apparently learned a great deal from his leader. He scored thirty-eight victories and was twice honored with the Hero of the Soviet Union Award. He also was made Chevalier of the Red Banner four times for his many air successes deep in German territory.

Glinka was one of the outstanding Russian military personalities of World War II. He was shot down in air combat behind the German lines, but after being captured he escaped and joined a force of Soviet partisans operating inside the enemy lines and fought with them as an infantryman against German SS storm troops before he finally reached his air unit.

The first Russian flier to win the Hero of the Soviet Union Award was a naval fighter pilot, B. F. Safonov, who while flying alone engaged several large enemy formations with outstanding success. On September 15, 1941, he was leading seven Russian fighters when they met a formation of fifty German single-seaters which pounced on them, but in spite of the heavy odds, the Russian pilots routed the Germans and chased them back to their own lines. Safonov, who was twice honored with the Hero of the Soviet Union Award, was killed in an air accident. He was held in such great respect by his

countrymen that a series of postage stamps were designed in his honor, and a national ballad written to his memory and widely sung.

Early in 1942 a number of French airmen refugees from occupied France who were unable to get across the English Channel, arrived in Russia through devious routes and offered their services. In time there were enough of these dedicated Frenchmen to form a special French legion which was known as the Escadrille Normandie-Niemen.

Nothing quite comparable to this escapee effort is to be found in the records of any other belligerent air service. Once they had marched the hundreds of torturous miles from their conquered country, their contribution was made under most difficult conditions. French airmen, who were serving with the British, could relax in well-heated, well-lighted messes and sleep in clean beds, but these volunteers fought vermin, cold, hunger, and personal depression as valiantly as they fought German attackers. Bedbugs were so disturbing in their slatternly shelters, it was better to sleep outdoors on the ground in crude sleeping bags.

They soon learned to accept these conditions, when they saw that their Russian comrades were equally uncomfortable; Soviet mechanics worked at subzero temperatures with their bare hands. There was six feet of frost in the ground, and few air fighters on any front endured such discomfort.

This small company was given two months of training on YAK-7s, an almost obsolete monoplane. A few YAK monoplanes in the 1, 3, and 9 classes were available eventually. They were made chiefly of wood—like the British Mosquito—but were very maneuverable in the air. These YAKs took off after a short run, climbed better than a Focke-Wulf, and were easier to handle than the Dewoitine 520 the Frenchmen had once flown.

The first missions of the volunteers were to escort bombers, and their chief difficulty was the condition of their airfield, which in places was a lake of mud, ice, and snow—in Russia the thaw is as uncomfortable as the cold. Nothing of interest happened until April 5, 1943, when Lieutenant Preziosi shot down a Focke-Wulf. Within a month the group's score was up to seven, but they had lost four valuable pilots.

At this time the Escadrille was transferred to another airfield at

Kationki. Their leader was Commandant Tulasne who slept in a log-roofed shelter on the airfield not more than twenty yards from his aircraft. It was he who really built up the Escadrille Normandie-Niemen. He was a remarkable man, from a well-known army family, and before the Russian venture he had been in command of a fighter group in Tunisia, and then in Syria, from where he escaped. On July 17, 1943, he took off at the head of a patrol of nine YAKS to escort Russian fighter bombers. When over the lines, the formation met thirty F-Ws and Tulasne disappeared in the ensuing combat.

Major Pierre Pouyade then commanded the Escadrille, and he came at a good time for the Germans were opening their July 1943 offensive along the Kursk-Orel front. They threw everything they had into the attack, including a crack army support corps led by a nephew of Baron Manfred von Richthofen, the World War I ace.

For more than a week Pouyade led his men through attack after attack, and they all came through with flying colors. He was that type of man, and deserves better attention for his wartime exploits.

Pouyade was a captain in a French Potez-63 night-fighter squadron when war broke out in 1939, and he served long and well through the opening months. By May 1940 his group was ordered to carry out day operations as ground-strafer or attack flights. During the first week of this unfamiliar work Pouyade was shot down in flames but he managed to get clear and escape unhurt. Shortly after this experience he was sent to the Far East and was assigned to a Morane-406 fighter squadron in Siam.

When the Thailand-Japanese political situation became precarious, Pouyade decided to make another move. The Japs had attacked Pearl Harbor and were planning to encompass all of Southeast Asia. In order to get out, Pouyade had first to find transportation. He uncovered an old 1925 Potez-25 biplane and small cache of gasoline, so he filled up the tank of the ancient aircraft and began what became a ten-thousand-mile junket that eventually led to London.

The first leg of the journey involved a five-hour flight over the Tonkin Mountains and when he landed safely in Chiang Kai-shek's empire he was taken to the Chinese by a Jap! Two American radio engineers of Chennault's Flying Tigers wormed him out of that situation, but getting away from the Chinese was not so easy and it was not until the early autumn of 1942 that a U.S.A.F. DC-3 took

him to the U.S. headquarters in Kunming where he gave valuable information to American Intelligence men concerning the Japanese early warning system.

A short time later Pouyade joined General Stilwell's forces and after that associated with the Free French Mission in China. It was here that he made an attempt to join the American Air Force, but his high hope never materialized.

In January 1943 he had reached Liverpool, England, but there he learned that due to his lack of the English language, he had little chance of joining the R.A.F. and flying immediately. Through an agreement arranged with General de Gaulle he was asked to join the Russians, and he arrived in Moscow in March of that year. He was soon flying with his countrymen in the hard-pressed YAK planes. These machines were no real match for the Messerschmitt 109s and 110s, but the forty volunteers had no choice.

Pouyade had little time to become fully acquainted before he was in command of the Escadrille Normandie-Niemen. During that violent summer he led many missions against the Luftwaffe over Yelna, Vitebsk-Orscha, and Smolensk, in which time seventy-seven German aircraft were shot down with a loss of twenty-five of the Escadrille's aircraft and pilots. By December 1943, Pouyade needed reinforcements, so he went to Algeria and came back with enough Frenchmen to fill out his ranks and make up a full Soviet air regiment by the spring of 1944.

The new YAK-3s gave them a better chance to compete with the opposition and by this time the air situation on the Eastern Front was most favorable to the Soviet forces. The French group engaged in ground-strafting and in support of Russian bombers along the central Russian front. During this period they downed thirty more German aircraft.

The French pilots took every advantage of the German difficulties and turned their attention to the inexperienced Focke-Wulf pilots who were operating out of East Prussia. Many of these young fledglings had been switched hurriedly from the old Ju 87, and were no match for the experienced Frenchmen.

On one single day in October 1944 the French group shot down twenty-six German aircraft without a loss to themselves.

Pouyade, who was now a lieutenant colonel, was in the thick of

this scrap. The escadrille was cited in a special Red Army Order of the Day and officially named the Normandie-Niemen Regiment.

A short time later Pouyade had his worst experience—one he still recalls and talks about in his present office of a noted port and sherry firm in Paris. On the occasion in point he was leading two squadrons of YAK-3s when he met a gaggle of fifty Focke-Wulfs. Pouyade led his force into attack and in the raging furor that followed, he was driven down to four thousand feet. There were few enemy aircraft to bother him and no French aircraft in sight, so he pulled up into a sharp turn, only to discover three Me 109s diving toward him. He then put on such a wild display of evasive action that he maneuvered himself completely out of control.

As he looked through the top of his canopy to orientate himself, he was startled to see the ground which seemed to be in a tight spin. He was obviously in an inverted spin himself, and no effort he made seemed to have any effect. Pouyade was certain he was on his way out. He tried to reach up (or down) to remove the canopy, but the centrifugal force of the spin held him as if in shackles. He knew he was trapped in the cockpit.

As he spun down past the 1000-foot mark he waited for the end, but then unaccountably the control column brought some response. Using all his strength, Pouyade was able finally to get the YAK off its back and into level flight some 150 feet off the ground. He returned to his base, and the next day had to make himself fly again in order to fight the grim dread that he might have lost his flying nerve.

By late 1944 the Normandie-Niemen Regiment was the toast of Russia, and Pouyade and his many aces were public figures in Moscow. The French leader had hopes of building his force up to 120 fighter planes, but the rapid disintegration of Germany made this effort unnecessary.

The R.A.F. was ready for retaliatory raids by the spring of 1942 and a series of attacks were soon planned; the first of any importance were aimed at industrial targets in the Paris suburb of Billancourt and nearby Poissy. Next Axis-Europe was bombed with great frequency. These mass attacks were concentrated on a single target, rather than a series of scattered objectives.

On March 26, R.A.F. aircraft shattered the Baltic port of Lübeck in a three-hour raid with 340 tons of high explosive. A month later they devastated the port of Rostock with 800 tons of bombs in four successive night raids that virtually razed the city.

This 1942 R.A.F. offensive reached its peak on May 30 when 1130 airplanes of all types delivered 3000 tons of bombs in a three-hour raid on Cologne. Two days later another air armada of 1036 planes bombed the Krupp works at Essen and set huge fires in the industrial regions on the outskirts of the city.

In the years following the war, saturation bombing received considerable criticism; it was argued that these attacks on cities were a great waste of effort and had little to do with the eventual outcome. It was pointed out that had the R.A.F. continued its strategic bombing against oil supplies and transportation, a decision might have been reached some time early in 1944. One expert asked what might have happened if the whole weight of 2,106,000 tons of bombs that were dropped by Britain and the United States had been concentrated on these two chief objectives.

German experts who were interrogated after the surrender were of the general opinion that if an all-out attack on the oil and chemical industry had been started twelve months earlier, the end of the war would have been advanced proportionately. One of them declared that concentrated attacks on the synthetic oil industry would have soon rendered Germany helpless.

One of the conclusions reached by the United States Strategic Bombing Survey was that the United States Air Force should have begun its attacks on oil targets much sooner than it did.

If we profit by the experience gained, we shall do little city-wrecking in a future war and concentrate on key objectives which generally are set up well outside urban areas.

On February 11, 1942, Lieutenant Commander Eugene Esmonde of the Fleet Air Arm received the Distinguished Service Order from H.M. George V at Buckingham Palace, for his part in the sinking of the German battleship *Bismarck*. The next day he returned to his Number 825 Swordfish torpedo-bomber squadron located at Manston.

Esmonde's small six-aircraft force had been training for some time for a special attack on three German pocket battleships holed up in

Brest harbor—the *Scharnhorst*, the *Gneisenau* and the *Prinz Eugen*. This attack had long been recognized as a suicide show, but one for which Esmonde had willingly volunteered. The small torpedo-bomber force had been brought to a land base for practice and other conveniences, and the personnel had been quartered with the officers and men of the R.A.F. fighter squadrons permanently based at Mans-ton. An odd factor in this situation was that Lieutenant Commander Esmonde was an exact double of Wing Commander Guy P. Gibson, hero of the raid on the Ruhr dams. Both men were unusually small, but both radiated a quality of confidence and strength that raised them above the ordinary group of flying men. Both had tremendous capacity for hard work, and both were willing to share any mission they themselves drew up.

When he had volunteered for this warship attack, Esmonde had been told that it would take place in late dusk or after dark. For some time he had worked out a training program for a low-level attack against the enemy vessels, which were presumed to break out during the night, if they were to escape from the bomb-drenched harbor of Brest.

Everyone concerned with the planned attack fully appreciated the value of top security, and each of the eighteen men in the small squadron of String Bags, as they continued to call the old Swordfish biplanes, realized it was not an ordinary show. They worked as they had never worked before; the day before the actual raid was made their armament chief who was responsible for the gunnery and torpedoes, collapsed in the dispersal bay from overwork and had to be rushed to the base hospital.

The day after Lieutenant Commander Esmonde received his decoration, startling news was brought from Dover. The German naval ships were apparently going to run the Dover gauntlet by day, rather than risk either bombs from high-level aircraft while at anchor, or the danger of sudden torpedo-bomber attacks under cover of darkness. This put a new complexion on the "suicide" show.

"Well, what of it," Esmonde muttered quietly, knowing full well that if the German battleships were taking this chance the String Bags were going to certain death. For himself, he did not care, but he regretted his failure to warn his men that it might possibly turn out to be a daylight attack.

Officials at Dover called up later with the information: "They're pulling out of Brest all right. They have been spotted off Boulogne."

When Esmonde explained the hopeless situation to his men, no one suggested that because they had volunteered for a night attack, they now could withdraw their services with no disgrace. Nothing was said. They just listened.

"In a few minutes we are going after them. Forget all you have been told of the night attack. We shall fly as subflights in line astern, height fifty feet. Our plan is to hit and thereby slow down one or all of these big ships. That's all," Esmonde told them.

Three squadrons of fighters from Biggin Hill were assigned to cover the Swordfish and keep Jerry Messerschmitts off their tails. Nothing could cover them from the antiaircraft barrage that the targets themselves and possibly their escort ships could put up. What happened was the tragedy of war tragedies.

Esmonde led off his force of String Bags at 12:25 P.M. to stop the remaining bulk of the German Navy. Just before they left they learned that there might be a slight delay of some "two minutes" by the Biggin Hill fighters in making the rendezvous. By this time they knew that the six torpedo-bombers and eighteen men were going out to attack a force of two battle cruisers, one heavy cruiser, six large destroyers, thirty-four E-boats and an assortment of flak ships. There would also be the Luftwaffe.

By 12:29 the weather began to deteriorate and according to reports from inland it would be closing in near the Belgian coast. With every minute, the German fleet was racing away and by now minutes were priceless. Esmonde took his small squadron up the coast and began circling Ramsgate hoping the friendly fighters would soon turn up. By 12:32 only ten fighters were to be seen and Esmonde probably knew his Swordfish had had it.

After waiting two more precious minutes, Esmonde realized he would have to forget about any real fighter escort, and gave the attack signal. The two subflights nosed down and, flying at fifty feet above the waves, they went into line-astern. The enemy force was now fifteen minutes away, and only twenty-three miles separated the flights from their glorious stand.

They knew they would have to fly as they never had before, but they also realized that at fifty feet there was little chance for aero-

batics or evasive tactics. At the same time it was not an easy task for the handful of Spitfires that had turned up to escort the slow torpedo-bombers. They were forced to weave, S-turn, and swoop at minimum throttle to stay anywhere near the String Bags.

When they were some ten miles east of Ramsgate two flights of Me 109s screamed in; machine-gun fire and air-cannon shells whipped through the flimsy fabric of the Navy fuselages. The British fighters took care of this first skirmish and chased the 109s northward, leaving a wide gap for a second formation of enemy fighters to move in. They poured down through a lancing rain and put a formation between the two subflights.

Under such circumstances the slower Swordfish could outmaneuver the Me 109s, and by careful evasion left the enemy fighters with nothing to shoot at but rain-drenched air. They held them off long enough for the ten Spits to return, then the torpedo-bombers reformed and continued on. At this point, for some reason unknown, the rear subflight went into V-formation when they should have been in line-astern. Twenty Me 109s slashed in again, and were turned back by three Spitfires, but not until Esmonde's aircraft had been badly riddled.

The constant maneuvering and twisting cut down the speed of the String Bags so that they were probably making only fifty knots while the enemy flotilla was unquestionably doing thirty or thirty-two. This meant that Esmonde would take some time actually getting at them, and he always hated attacking an enemy vessel that was racing away from him. He had had several unpleasant incidents of that sort in the Mediterranean.

Long strips of fabric streamed back from most of the aircraft showing that they had all taken plenty of punishment. At 12:50 they sighted the enemy battle fleet and for the first time realized its full strength. Ahead and stretching into the murk beyond on either flank, were long lines of escorts putting up inner and outer screens of defense. There were the wicked destroyer screens hugging the sides of the great cruisers, but even worse at levels ranging from 50 to 2000 feet, hundreds of Luftwaffe fighters swarmed back and forth. It was the largest air "umbrella" ever seen covering a naval force at sea. Had any of the Swordfish turned and flown away, no one would have questioned the decision or the courage of the crew.

The British leader aimed his craft at the first ship in the column, the *Scharnhorst*. There was no question in Esmonde's mind but that he would put his torpedo into it, or die in the attempt. The E-boats below shot up a curtain of hissing tracer and a dozen fighters roared down from above to stop the impudent, rash Britisher. The ten Spitfires which had been escorting them were lost in a tangle of dogfights somewhere in the melee above. Other Spits that had arrived late from Biggin Hill could attempt only to harry a rear-guard force of Messerschmitts. Another fighter force from Hornchurch missed the rendezvous, proceeded to Calais, found no sight of the enemy, so put on a short patrol and returned to their base.

Esmonde fought his way through the first flak curtain and vaulted the outer screen of defense. The second wall of heavier flak seemed to halt the Swordfish like chain mail, but eventually the lead Swordfish staggered on. Through all this, tight elements of Me 109s swept down on them with machinelike regularity.

Now there were but three thousand yards to go. The light anti-aircraft fire slackened somewhat, but more enemy fighters moved in to pour down their venom. A pack of Focke-Wulf fighters raced screaming into the fray with machine-gun and air-cannon fire.

The subleader's navigator, Edgar Lee, sensed their guns had stopped firing and saw that their gunner, Johnson, was sprawled out over his mounting. He tried to haul him clear, but it was impossible, so he moved up to help his pilot by calling out the positions of the attacking fighters.

The task was hopeless. One by one, the brave Swordfish went down. Esmonde got within attacking distance of one enemy cruiser and released his torpedo, but was cut down and killed before he could see what success he might have had. Fuel tanks were blasted to colanders, controls were cut away, pilots were torn to ribbons and fell over their controls. Now and then another torpedo was released, but no direct hits were scored.

Five of the eighteen men lived to tell what had happened. The German cruisers escaped because of their daring and daylight gamble. Again, air-cover had won a naval action; air-cover that might have been shot out of the skies, had the men of the Fighter Command played their part.

Two or three Swordfish crewmen were picked up by the British

motor torpedo boats or Sea-Air Rescue craft. Edgar Lee was the only one who could walk away from the rescue boat when it landed and it was he who was able to give the full details of this Fleet Air Arm trial and sacrifice. It was a story of eighteen men, protected only by aircraft fabric, attacking 4000 who were shielded by Krupp armor plate. Lieutenant Commander Esmonde was awarded the Victoria Cross posthumously. The officers who lived were given the D.S.O., and all other men suitably decorated posthumously.

About six weeks later, at the end of April, a body, kept afloat by a semi-inflated life jacket, was carried up to the mouth of the Thames by the tides and washed ashore on the Kentish coast. The dead man wore the uniform of a lieutenant commander in the Royal Navy. Gold wings on his sleeve indicated that he had belonged to the Fleet Air Arm. Thus, Lieutenant Commander Eugene Esmonde, V.C., returned to his native land.

On April 18, 1942, an American air raid was staged over Tokyo that stunned the Japanese people and puzzled the rest of the world. An American raid on Tokyo? How could such a mission be carried out? On paper, it was impossible since there were no land bases within striking distance of the Japanese Empire. It was reported that a number of B-25 land planes had carried the 500-pound bombs, but if so, from where were they launched in order to reach Hirohito's capital?

Actually there was no such base, but in this case U. S. Army Air Force bombers were flown off a U. S. Navy carrier deck; they rained down their missiles on three Japanese cities and continued on to seek refuge in friendly areas along the China coast.

James H. Doolittle, then a lieutenant colonel, and, at the age of forty-five, an almost overage retread, led this mission of sixteen B-25 bombers which struck the first blow for American prestige in the Pacific. It was the first offensive punch delivered by an American military force, and a feat that has not been fully appreciated, even by aviation enthusiasts, for it was followed quickly by the Battle of Midway which soon absorbed all war news space and world headlines.

The Doolittle raid was the first time that land-type aircraft of such size had been launched from an aircraft carrier, and the mission

was prepared secretly for many weeks. All participants were volunteers, although only Doolittle knew what he was volunteering for. The training consisted of low-level bombing and learning to take off with a full load from a very restricted area. Few of the men had any idea that all this practice had anything to do with a war operation from a naval aircraft carrier, but eventually crews and aircraft were loaded aboard the *Hornet*.

The plan was to move the carriers to within 500 miles of the Japanese mainland, regardless of the risk, and then fly the land bombers off with orders to hit Tokyo, Nagoya, and Kobe. When the naval force was some 688 miles from Japan, however, it was apparently sighted by two Japanese patrol ships. Fearing that the bulk of the Japanese Navy would be alerted, Doolittle elected to take off immediately, ignoring the fact that a flight of this distance would require much fuel and allow little reserve, to reach the China mainland. The take-off was made in most unfavorable weather, but all sixteen aircraft were airborne safely.

Thirteen of the B-25s dropped 500-pound bombs on Tokyo, two made a successful attack on Nagoya, and the last one found the docks at Kobe. All made their escape from the target area and continued on. Oddly enough, the city of Tokyo had just carried out a very elaborate air-raid drill a short time before the B-25s appeared and this naturally created considerable confusion. Although no important military objectives were seriously damaged, the raid revived the spirit of the Allied nations, and particularly that of the American people, for the Japanese had had a series of amazing conquests with very little loss on their part. From December 7, 1941, to May 1, 1942, the main Jap carrier force alone, ranging from Pearl Harbor to Ceylon, had sunk five battleships, one aircraft carrier, two cruisers, and seven destroyers. They lost nothing larger than a destroyer.

All but one of Doolittle's B-25s landed on the China coast and most of the crews were saved and smuggled out. One came down in Vladivostok, U.S.S.R., and that crew was finally returned to the United States, but the aircraft was never released.

As a token raid on the enemy, the Doolittle strike was a bold, well-planned and instructive experience, but few could realize the eventual result of the mission—the Battle of Midway.

While U.S. naval strength had grown and moves were being made

to call a halt to the Japanese expansion, matters began to shape up for a naval battle which was fought May 7-8 in the Coral Sea guarding the shores of New Guinea, the Solomons, and New Caledonia. On that day carrier planes from an American task force sighted a large Japanese flotilla steaming toward the Louisiades. Aircraft from the *Yorktown* and the *Lexington* sped to the attack. The resultant battle was the first major engagement in naval history in which the surface ships did not exchange a single shot, a testimony to the military air age. In this Battle of the Coral Sea, American naval aircraft sank the carrier *Ryukyu*, four cruisers, and three destroyers. American losses were also severe; most serious was the loss of the giant aircraft carrier *Lexington*.

It should be noted here that Australian and New Zealand airmen played an important role in the battles that raged through the Southwest Pacific. They fought long and well in what was first, the defense of their homeland, and then the great retaliation that swept on to Tokyo.

The Royal Australian Air Force, in particular, distinguished itself, although at the outbreak of war in Europe it had very little to work with, beyond a proposed three-year expansion program. A thirty-two squadron service was planned, to be made up of general reconnaissance, general purpose, army co-operation, and two fighter squadrons. For months they did their best with a few Short Sunderland flying boats, a gaggle of Lockheed Hudsons, and a small donation of British Demons, Seagulls, and Ansons. An Empire Air Training Scheme eventually produced 10,000 air-crew members who had to finish their training in Canada.

Early operations were confined to antisubmarine and shipping search missions. Two squadrons were quickly sent to Port Moresby, while others set up camps in Malaya, and when the Japs first struck in the Pacific, it was Australian-flown Hudsons that hit back at a seaplane refueling base at Tobi Island. With each new enemy attack, the Australians, along with New Zealanders and a few Dutch units, tried to stem the tide, but the Zero fighter mowed them down and scattered their base personnel.

All through the bitter months of Japanese successes the R.A.A.F. continued to strike back with whatever they had. American aid helped and when the Australian Department of Aircraft Production pro-

duced a number of Bristol Beauforts, these two-engined planes were flown on a variety of missions, from fighter to torpedo-bomber forays. These Beaufort squadrons played an important part in the Malayan campaign, over New Guinea, and other targets when the R.A.A.F. became a component of the Allied Air Forces in the Fast East.

The Coral Sea battle was not a clear-cut victory, but it checked the tide of Japanese envelopment and within a month the United States Navy scored a blow that later marked the ebb of Japanese power in the Pacific.

Doolittle's raid had deceived the Japanese into assuming that he had jumped off from some U.S.-held island air base. By excepting the Aleutians, they figured that the American outpost nearest to Tokyo was Midway Island, some 2200 miles to the east. President Roosevelt had jocularly explained that Doolittle had jumped off from "Shangri-La," a jest the Japanese had taken seriously, and from a study of their charts, came to the conclusion that Midway had to be the mysterious Shangri-La. Midway had to be wiped out, or better still, captured.

Early in the morning of June 3, 1942, a PBY patrol plane spotted a large flotilla of enemy vessels some 700 miles west of Midway. A careful survey revealed that the force was composed of about fifty-three warships and more than twenty troop transports, obviously heading for Hawaii, but also girded to knock out the rest of the U. S. Navy.

The Japanese code had been broken by American Intelligence, and as these reports came in, headquarters set up immediate counter-measures. Rear Admiral Raymond A. Spruance concentrated all available warships around Hawaii. The *Yorktown* was called back from the Coral Sea and every available Flying Fortress bomber was rushed over from as far away as Ireland. The defenses at Midway were reinforced and although Dutch Harbor in the Aleutians was under attack, the Navy considered Midway to be its chief task.

The Japanese armada outnumbered anything Admiral Spruance could put against it, but he had the advantage of air bases in Midway and Hawaii. As in the Coral Sea battle, this conflict was fought entirely by airplanes—and submarines.

Early on the afternoon of June 3, Flying Fortresses from Midway rained high explosive on a squadron of landing ships, but the Japs

retaliated with a wicked bombing of Midway the following day. Some shore establishments were severely damaged but the airfields were not disrupted. Next, a pack of Marine Corps dive bombers set about the Japanese force and in this attack Major Lofton R. Henderson made an unbelievable display of heroic sacrifice. His force of scout bombers reached the enemy ships before the slower SB2Us, and two carriers, clearly marked, were sighted. One of these was the *Soryu*. Henderson began a wide let-down from 8500 feet preparatory to launching a glide-bombing attack from 4000 feet, rather than the regular dive-bombing routine. At about 7000 feet the first enemy fighters attacked and Henderson's plane was soon in trouble and began to burn. Realizing that he had no future as a glide bomber, Major Henderson actually directed his burning aircraft into the superstructure of the aircraft carrier *Soryu*. Eight other scout bombers were shot down.

This was the unhappy beginning of the Battle of Midway.

By this time the U.S. Fleet had come within air-striking range of the Japanese squadrons and swarms of airplanes, including the famous Torpedo Eight flight from the *Hornet*, set out after their prey. More than forty torpedo planes roared off the decks of the American carriers, *Hornet*, *Enterprise*, and *Yorktown*, as well as a number of dive bombers armed with 500-pounders.

Torpedo Eight, which was flying the almost obsolete Devastator and was led by Lieutenant Commander John C. Waldron, became separated from the other formations during a long search for the Japanese surface fleet. One group of bombers and fighters, which also failed to find the enemy in time, had to land on Midway when they ran out of fuel. In the meantime Waldron reasoned that the Japs had been driven off. He therefore backtracked over his previous course and finally sighted the enemy, but he had no fighter protection, nor dive bombers to disperse the antiaircraft fire.

Waldron figured that an important point of his mission had been completed—locating the retiring Japanese force. His aircraft were running low on gas, so he radioed his information and requested permission to withdraw and refuel.

The admiral who received this request had a very difficult decision to make. If he permitted Waldron to withdraw, it might make all the difference between intercepting and crippling three enemy car-

riers. Three carriers could tilt the balance of power in this particular situation. The equation of scores of ships and thousands of lives against fifteen aircraft and the lives of their three-man crews finally resolved the issue. In many ways it resembled the decision of Lieutenant Commander Esmonde when he attempted to stop the *Gneisenau* and *Scharnhorst* in daylight, rather than at night.

"Attack at once!" the admiral ordered.

The old Devastators leveled for the assault in the face of terrific anti-aircraft fire and enemy fighter attack. Just as he started for a Japanese aircraft carrier, Ensign George H. Gay, Jr., of Houston, Texas, a pilot of one of the doomed planes, heard his gunner scream and saw him flounder over the gun mounting. Gay launched the long projectile clean and then pulled up and around to speed astern as fast as possible. As he did so, an explosive shell from a Zero fighter ripped through the rudder controls, a piece of the casing slashed Gay's left leg, and almost simultaneously a machine-gun bullet struck his upper left arm.

With calm deliberation, Ensign Gay made an effort to pancake his machine several sea miles astern of the main action. His gunner was dead, and for some unknown reason the radio man was unable to climb out of his cockpit in time to save himself. As the Devastator went down, Gay grabbed a small buoyant cushion that the gunner-bombardier used to kneel on while taking a sight.

Gay then played hide and seek with the Japanese pilots who were supposed to be machine-gunning helpless airmen who had had to bail out. He took time to bandage his leg and care for the bullet wound in his arm. He had no idea that he was the lone survivor of Torpedo Eight; but more important he was the only nearby eyewitness to the destruction of a 26,900-ton carrier of the Kaga class and the probable sinking of two other blazing Japanese carriers. He also watched the desperate circlings of Japanese naval airplanes that were unable to find refuge on their blazing and battered mother ships.

From his fish-eye view as he huddled beneath the sheltering pillow he saw the complete historic action as a line of burning Japanese ships passed by in fantastic review. Several surface craft gave Gay narrow escapes; one enemy destroyer appeared to be driving straight at him as she sped to a stricken carrier, but she finally curved away with but feet to spare. A heavy cruiser steamed past less than five

hundred yards from him, and he saw her crew lining the rail as they grimly watched the unexpected destruction of their force.

As the afternoon drew to a close, the Japs made a frantic effort to stem the U. S. Navy rush. An enemy cruiser tried to stand alongside one of its crippled carriers, but it could not approach close enough. Then, regardless of the fact that there were survivors on board, the cruiser raked the carrier so as to scuttle her and destroy the evidence of the U. S. Navy's successful attack. Some time later a Jap destroyer managed to come alongside the still floating hulk and remove the few poor devils who had lived through the double carnage.

Gay next repaired his life raft with a number of special patches, inflated it with its small carbon dioxide bottle, and settled down for the night. Several hours later a Navy patrol, out on a routine search, spotted his rubber dinghy, and returned a short time later and picked up the young flier.

When a doctor in a hospital asked the ensign what he had done in the way of treatment for his wounds and burns, Gay solemnly answered, "Well, I just soaked them in a salt-water solution for about ten hours, sir."

At base headquarters Ensign Gay gave the first eyewitness account of the Battle of Midway. He told of the thunderous and highly successful attacks made by American dive bombers and torpedo planes against at least four Japanese aircraft carriers. Admiral Chester W. Nimitz, Commander in Chief of the Pacific Fleet, personally revealed this epic story of the only man of Torpedo Eight Squadron who lived through the battle.

The Japanese actually lost four aircraft carriers, one heavy cruiser, and another heavy cruiser, two destroyers, and one oiler were badly damaged. They also lost 332 aircraft, 280 of which went down with, or were washed away when their carriers sank. Ten seaplanes were destroyed, and twelve fighters were downed in air combat. Six bombers were destroyed in the strike against the Midway air base. About 4800 Japanese men were either killed or drowned.

On the other side of the ledger, the United States lost the *Yorktown* and the destroyer *Hammann*. A total of 147 aircraft were shot down or destroyed, of which 109 were carrierborne, and only 38 were land-based ships of the Army, Navy, and Marine Corps. Personnel losses were 92 officers and 215 enlisted men.

Without question, the Battle of Midway was the turning point of the Pacific War. It was a defeat so decisive and grave that the details were kept a guarded secret within a limited circle of the Japanese Navy. Had Midway been as much of a surprise attack as had Pearl Harbor, there is no knowing what success the Japanese might have had. As it was, U. S. Naval Intelligence was able to cope with every move the enemy made, and the brilliant handling of the forces available was rewarded with a victory that will long stand as a splendid example of naval air warfare.

In the early summer of 1942, the Mediterranean from Gibraltar to Alexandria was practically a German-Italian lake. For well over fifteen hundred miles of battle-churned water only a small nubbin of rock less than seventeen miles long was still under British control. This was the heroic island of Malta. Its once great naval harbor had long since been bombed out of usefulness, and had been abandoned by the fleet. It was in a state of virtual siege and small convoys sent out to supply the beleaguered forces were usually scattered or sunk long before they were within sight of the island. Food for human existence, and fuel for a small covey of aircraft were always at a low level. Nevertheless, Malta and its small garrison held out against the forces of the combined enemy—standing alone for many months.

But the airmen there were not always on the defensive. They were charged with harassing Axis communications between the European mainland and North Africa, and a few were given the task of shooting up Rommel's rear guard. Month in and month out the Luftwaffe and the Italian Air Service plastered little Malta with high explosive and incendiaries, sending over as many as a dozen raids a day. Among the Allied nations only a few perceptive people had any idea of the heroic stand being made—there were a hundred other fronts and battles to occupy the attention.

It was a young Canadian lad, George F. Beurling, who illuminated the stand being made by the Maltese, and engraved the heroic story into the headlines of the day. Without "Buzz" Beurling and a handful like him, Malta might not have withstood the Mediterranean blitz.

In June of 1942, Beurling was a sergeant pilot with the R.A.F. Why he was not serving with the Royal Canadian Air Force is an

interesting study in social values. Early in the war he volunteered for the R.C.A.F., but was brushed off with, "Go get an education. You haven't even finished high school!"

Two and a half years later he returned to Montreal with a Royal Air Force commission he had won over Malta. He had his pilot's wings, four decorations for heroism and valor, an official score of twenty-nine enemy aircraft destroyed—and a new nickname. Now he was "Screwball" Beurling.

The R.A.F. motto, which was adopted from that originated by the old Royal Flying Corps, is *Per Ardua ad Astra* and means "Through Difficulties to the Stars." This was the route George Beurling took to prove himself. He came from a weather-worn frame dwelling in Verdun, a working-class suburb of Montreal, and gained as much formal education as his family income would allow. When he finally slipped the bonds of Bannantyne School he worked at odd jobs, usually at the old Lasalle Road Airport where he earned enough to obtain a little private-plane flight training.

When the R.C.A.F. recruiting officer turned him down in 1940, "Buzz," as he was then known, worked his way over to Britain on a munitions ship and volunteered for the R.A.F. Everything was okay, except that he had forgotten to bring his birth certificate, so he worked his way back again on an oil tanker, picked up the necessary paper in Montreal, and hopped another tanker back through the U-boat infested North Atlantic.

Convinced that this young man meant business, the realistic British overlooked his lack of a complete formal education and permitted him to enlist and become a sergeant pilot. He was a natural for Spits and within a reasonable length of time he was making regular patrols out of British fields, but somehow always getting into trouble by his unorthodox flying and refusal to conform to the accepted rule of formation flying. By the spring of 1942 "Buzz" was an experienced airman and had shot down two enemy aircraft, but he was considered a Peck's Bad Boy in operational discipline and general behavior. At one time the British assigned him to an all-Canadian squadron, hoping that an association with his countrymen would bring out a better side. He stayed there less than a week and begged to be returned to a regular R.A.F. unit. He was still looked upon as an uneducated interloper, but it must be admitted that George

Beurling made little effort to ingratiate himself with his Canadian comrades.

His commanding officer next suggested that Beurling apply for a commission, and he would recommend him if "Buzz" would just make the effort.

"Nothing doing! I don't want to be an officer. I'm not the type and I want to stay with my sergeant pals. I won't have them saluting me."

There was nothing they could do with the rebel, so they gave him all the war patrols he could handle and hoped he would keep out of trouble. Beurling stayed alive, developed a new technique of what he called deflection shooting, and continued to fly the lone-wolf patrol whenever he could slip away from his flight leader.

One day George heard that one of his pals had been selected for an overseas assignment. The young man was newly married, his wife was expecting a baby and, as might be understood, he was not too eager to go abroad at this particular time. Beurling solved his pal's problem by volunteering to take his place, kidded the Orderly Room sergeant to retype the orders, and gladly went off to Malta where the fun was fast and furious.

From all accounts Beurling behaved worse in Malta than he had in Britain, but the operations were so unconventional that he could do all the lone-wolf flying he wished. He flew as many as seven or eight patrols a day from the embattled island, taking on anything that appeared from the other side of the Mediterranean. When he wasn't flying, he was practicing his deflection-shot theories at a test bunker. He drove everyone stark raving mad with his vitality, activity, and brusque speech. Fortunately, he had a leader who coaxed him along and eased him down gradually without going to any harsh disciplinary lengths. By now "Buzz" was being called "Screwball" Beurling—but he was getting credits for his efforts. To his Distinguished Flying Medal, won shortly after he arrived in Malta, he picked up a bar (a second D.F.M.). His amazing trick of deflection shooting was paying off. Deflection shooting means shooting that takes into account the angle of the aircraft to the enemy plane, their respective speeds, and the distance from each other. If a pilot could always attack his enemy dead on, nose to tail, and the target was always full in the sight when the guns were fired, there would be no

need for deflection shooting but, as Beurling argued, "How often does that happen? Most of the time you are approaching your enemy at an angle and he flies at one speed and you at another, so there are several factors to take into account. If I hadn't studied deflection shooting, I'd have a bag of about five or six, instead of twenty-nine."

He became such a master of deflection shooting that the British Air Ministry encouraged him to write an instructional treatise on the subject.

As discipline gradually took effect and Beurling began to carry his weight in formation, his score rose with every day of action. He shot down aircraft singly, and he shot them down in bunches. Oddly enough, he had more respect for the Italian fliers in the Reggians than he did for the Germans in the 109s and Focke-Wulfs.

On July 12 he destroyed three Italian Macchi 202s and later that day he sent down two Messerschmitt 109s and two Macchis and damaged two other 109s. With his D.F.M. and bar, and good behavior, he was finally induced to "accept" a commission. On October 10 he was awarded the Distinguished Flying Cross for one of his "two-down" days. Two weeks later he was given the Distinguished Service Order when, after destroying three enemy aircraft, he saved his flight commander by deflection-shooting another off his leader's tail, and then was shot up himself and had to take to the silk. He was slightly wounded in the heel in this foray and the medicos decided that the past six months had been enough for anyone and recommended a leave home.

Beurling was flown out in a Liberator which added to the "Screwball's" history by cracking up at Gibraltar. Sixteen passengers and crew members were killed, several more were severely injured, but Flying Officer George Beurling walked ashore with only a few superficial bruises. Later he was flown back to Montreal where the program of continued welcome gave him more headaches than all the enemy pilots over the Mediterranean.

The rest of his story is somewhat tragic. On his return to Canada he suffered several physical breakdowns. He could not fit into the accepted picture of the air ace. The publicity and public adulation did not sit lightly on his shoulders. He couldn't be fitted into any staff or desk job and he made no real effort to adjust to the standards the rest of the services had adopted. After the war, he drifted

from job to job, since the peacetime service had no place for him. He argued that he knew only one profession—air fighting—and eventually he made a contact with the Palestine government to fly as a mercenary pilot with their air force. On May 20, 1948, while testing a Canadian Norseman monoplane in Rome, he was killed when the aircraft faltered on take-off, crashed, and burst into flames. A short time before, Beurling had stated that the Palestine government had offered him \$1,000 a month to fly as a fighter pilot for the "Jewish Air Force."

"I'll be glad to get back into combat," the Falcon of Malta is reported to have said. "I'll drop bombs or fire guns for anyone who will pay me."

Have you ever heard of Paddy Finucane?

He was Wing Commander Brendan Finucane, D.S.O., D.F.C. (with two bars) and a score of thirty-two enemy aircraft. You could walk the streets of London, or Dublin-on-the-Liffy where he was born, and I doubt whether one person in a hundred would have any idea who Paddy Finucane was or what he had ever done. Yet in those anxious days of 1942 when the free world trembled on the brink of bitter defeat, Paddy Finucane with his lithe grace, his winning smile, the forelock of dark hair always tumbling over his friendly blue eyes, was raising merry hell with the Luftwaffe.

Paddy was the complete antithesis of "Screwball" Beurling. He was born on a mellow autumn day in Dublin on October 16, 1920. His father was Thomas Finucane and his mother was called Florence. A few days later in the rose-green and gold-patterned light of the Roman Catholic Cathedral in Marlborough, he was christened Brendan. He was, of course, called Paddy almost from the cradle and he always explained, "I suppose Brendan is my name, though I seldom think of it and only use it in matters of state."

Paddy Finucane, then, was Irish, but totally unlike the conception of the two-fisted, hairy-chested, phony-brogue speaking mick so popular in the United States. Most of his life was spent in England and in a beautiful memoir written by James Reynolds, the famous Irish historian, we discover that this R.A.F. hero was a cultured youth, a rare student and a gentleman athlete who did everything well. He

read most of the classics and turned out page after page of lilting poetry. Once he started a letter with:

“I feel the shadow of wings across my face,
Icarus wings, faltering in my flight.”

Many of his poems were never finished, chiefly because he was never satisfied with his work, but had he lived through the war, he would no doubt have become a great writer. Unfortunately, he was sensitive enough to realize that he had no great chance of outwitting death in the war. Paddy liked good food and rare wines. He loved the heroes of Greek history and once when leaving a Soho restaurant with Reynolds, he stared up into the war skies and watched a formation of British bombers heading for Hitler's Germany. He said, “Often and often, I'm put to it not to collide with the stars up there, and me dodging in and out of the clouds. Stars now, have a great hold over me.”

Slowly his smile faded and he added, “Do you know, even the big green shamrock I have painted on my plane won't save me for long. All I ask of St. Kevin is that I am cut off clean—no ragged ends.”

St. Kevin must surely have heard his wish. There were no ragged ends.

Brendan Finucane joined the R.A.F. in the autumn of 1938. He had two brothers, Raymond Patrick, a bomber pilot who lived through many long-range raids into enemy country, and Kevin, who was in school at the time.

As the war progressed Finucane was made a leader of Number 452 Squadron, an Australian unit which had started its training Down Under, continued it in Canada, and perfected its skill in Scotland. The day Finucane joined them they went into action. By July 17, 1942, Paddy had piled up thirty-two planes, confirmed. He damaged dozens of others but never mentioned them unless he saw them crash, explode in the air, or break up before his own eyes. Those who knew and flew with him declare that he was the most accomplished flier in the war.

On his twenty-second birthday he led a sweep over occupied France, accompanied by Flight-Lieutenant Keith Truscott and Pilot Officer Dick Lewis. As so often happens, it was a million to one shot that brought down this youngest of Allied wing commanders—a shot

fired by a temporary and hastily assembled antiaircraft gun manned by two German sentries near Le Touquet.

Finucane wheeled into the sky like a wounded bird. His wing man called to him over the radio, "You've had it, sir, in your radiator."

Paddy turned his Spitfire toward home but continued to lose altitude. He made no attempt to get out, so he may have been badly wounded. We shall never know. The crippled aircraft hit the waters of the English Channel tail first and immediately disappeared from sight off Point L'Touquet. The last that was heard from the young leader was, "This is it, chaps," and we must presume that St. Kevin had sheared all the ragged ends.

Off on the other side of the world a New Hampshire man was winning the second Congressional Medal of Honor awarded to an airman in World War II. The first had been hung around the neck of Jimmy Doolittle for his leadership during the historic raid on Tokyo.

On August 7, 1942, Captain Harl Pease, Jr., a native of Plymouth, New Hampshire, maintained the highest traditions of the service with his heroic action that came as the climax to a number of seemingly unrelated events.

When one engine of the bomber, of which he was the pilot, failed during a mission over New Guinea, Captain Pease was forced to return to a base in Australia. Knowing that all available aircraft in his group were to participate the next day in an attack on an enemy field near Rabaul, New Britain, he selected the most serviceable machine at his base and prepared it for combat. Captain Pease was not scheduled to fly on this Rabaul mission as he had been doing more than his share for the month previous. However, he ignored that and personally prepared one airplane for the next day's raid although this particular plane had been written off for further combat.

With members of the crew who had volunteered to accompany him, Pease rejoined his squadron at Port Moresby, New Guinea, at 1 P.M. on August 7, after having flown almost continuously since early the preceding morning. With only three hours rest he took off with the squadron and throughout the long flight to Rabaul managed

by most skillful flying to keep this "unserviceable" aircraft in its proper position in the formation.

The raid unit was intercepted by about thirty Japanese fighters before they reached the target. Pease was on the formation corner that took the brunt of this hostile attack, but gallant action and the accurate gunfire of his crew, succeeded in destroying several Zeros and they were able to get to the target and drop their bombs.

The fight with the enemy aircraft then continued and lasted for twenty-five minutes when the bombers dove for cloud cover. After leaving the target Captain Pease's aircraft began to falter and fall behind and he was unable to reach the cloud cover that had sheltered the others. The Zeros pounded away and finally ignited a bomb-bay fuel tank. The crew managed to jettison the flaming container, but it is believed that Captain Pease's aircraft and crew were subsequently shot down in flames, since they did not return to their base.

In voluntarily performing this hazardous mission, Pease contributed materially to the success of the raid. He displayed high devotion to duty, great valor and complete contempt for personal danger.

An organization listed as First Heavy Bombardment Wing, United States Army Air Force, and affectionately known as First Wing to practically everyone in the United Kingdom, was the first American military force to strike at Hitler's Europe. Their initial raid against an enemy target was staged on August 17, 1942.

The first complete American bomber organization to reach the European Theater of Operations was the Fifteenth Bombardment Squadron which had trained with the R.A.F. while flying Douglas A-20s. On July 4, 1942, six crews of this squadron accompanied an R.A.F. sortie against a number of enemy airfields in Holland. This was more of a token strike, but it presaged what was to come.

The heavy bomber mission that was flown about six weeks later was made up of twelve B-17Es of the Nineteenth Bomber Group led by Brigadier General Ira C. Eaker. They went to Rouen as a workout for the great daylight raid program in the future. It was not a large or important raid, and they were well-covered by Spitfire fighters and had little trouble getting to their target.

Gradually, the pace was increased and larger formations were available and greater distances were attempted, and it soon became appar-

ent that the Eighth Air Force fully intended to continue these daylight raids, although by this time the R.A.F. and the Luftwaffe had assayed their daylight casualties and switched to night bombing.

At this point it might be well to clarify this difference of opinion. Both sides presented sound arguments for their decisions. Both sides based their findings on the problems at hand, the equipment available and the specific training each had experienced. Contrary to the general impression, the U. S. Army Air Force did not decide to bomb by daylight "to show up the R.A.F." It was not a matter of which was more dangerous; it was simply an honest opinion as to which would do the best job with the equipment available.

Once the R.A.F. had fought off Goering's day and night raiders during the Battle of Britain, they turned to retaliation and carried out what raids they could with the few groups of medium-range bombers they had ready for these forays. They discovered immediately that, like the Germans, they too had no fighters that could escort their bombers over long missions. They had no choice but to fly at night and trust in the defense put up by their own air gunners. When they later developed their own long-range Stirlings and Lancasters they still had no fighters that could accompany these heavy bombers into enemy territory, so they continued to train their bomber crews in night flying, night navigation, and night bombing. There was no other choice.

The U. S. Army Air Service had a reasonable amount of time to study the war situation in Europe. By the winter of 1941-42 Hitler no longer threatened Great Britain, the possibility of an invasion had been erased by the stand of the Russians. Other German forces were fully occupied in North Africa and there was no great emergency to counter in Europe. America's problems of the minute were out in the Pacific or along the U-boat lanes of the Atlantic.

The United States went into the European conflict with two fairly efficient heavy bombers—the Flying Fortress and the B-24 Liberator—and a very accurate Norden bombsight. There was no boastful determination to outdo the R.A.F. in bombing enemy territory. After long, co-operative conferences with the British, U.S. military officials came to the conclusion that the Eighth Air Force could best help the over-all effort by staging their raids during the daytime, while the British filled out the program with their night operations.

The British were satisfied that in the beginning saturation bombing—a bombing pattern designed to cover a complete target area—was the best they could do. They had a very good bombsight too, but up to 1942 they had found no particular reason to concentrate on precision, or pinpoint bombing. By the spring of 1943 they had an Empire Air Training plan that was producing skilled air crews by the hundreds. They had swarms of new heavy bombers capable of striking at any target in occupied Europe, and there were thousands of important targets to saturate. They were in full production, and saturation or pattern-bombing filled their particular needs.

“Let’s batter their factories, their supply dumps, their marshaling yards, their chief points of communication. Certainly a U-boat pen doesn’t need precision bombing. There we need tremendous concentration to batter down their concrete redoubts. Later on, when we have run out of mass targets we can perhaps consider precision bombing to take out particular cores of enemy strength,” the R.A.F. commanders explained.

Unfortunately, small groups of generally uninformed newspapermen took up the question and soon exaggerated it into a major inter-Allied dispute—something it never was. Wars can no more escape the self-appointed strategists, than a football team can evade the Monday-morning quarterbacks. The British never actually questioned the Eighth Air Force’s decision to carry out daylight bombing raids, but they did explain, with much friendly concern, that Goering had not been able to do it over Britain and that the R.A.F. had received serious casualties when they had tried it over Germany.

The decision wasn’t simply a matter of national temperament, or a grandstand gesture. American air crews had not been expertly trained in night operations, but they were very good under daylight conditions. There were very proud of the Norden bombsight, which, according to the catch phrase of the day, “enabled a bombardier to drop a 500-pounder in a fish barrel from 20,000 feet.” A great deal had been made of the precision instrument and it was widely publicized. Also an absurd program of security surrounded it; the bombardier was always escorted from the bombsight supply room to the steps of the bomber by at least two armed sentry escorts—to keep it out of the hands of subversive personnel. This rule was continued for months after dozens of Norden bombsights had fallen into the

hands of the enemy during bombing raids. This worship of the Norden bombsight may have had something to do with the U.S. decision to bomb only during daylight.

Newspaper experts demanded to know of what use was a bombsight that permitted precision accuracy, the fish barrel from 20,000 feet, if the prevailing weather over the target areas blanked out a view of the barrel, and stated that high-level precision bombing was possible for not more than twelve days out of the year. The same argument stands for night bombing. The British had devised the Pathfinder system in which a highly skilled navigator first found the target. Next a special marker plane put down a pattern of marker lights, the color of which were changed with each raid; and the main bomber force followed on through and plastered the marked area.

The British expressed one natural concern: "We hope you will concentrate on daylight operations—they will complement our nighttime efforts tremendously—but how do you expect to fight through the swarms of enemy fighters?" In other words, how can a comparatively slow heavy bomber fight on even terms with a very maneuverable fighter plane?

On October 10, 1942, the First Wing provided what it considered the perfect answer to the question. It flew an unescorted daylight mission to bomb the enemy locomotive shops and the railroad marshaling yards at Lille in occupied France. A bag of forty-eight enemy fighters was shot down without the loss of a single bomber, a claim that was never denied. It was an unusual performance and one that was not repeated over the next fifteen months.

We who covered the activities of the Eighth Air Force in Britain during those early days quickly realized that, despite the hazards of daytime raiding, the decision played a great part in the eventual downfall of Germany. Regardless of which style of bombing was the more rewarding, the effect on the German population and the labor slaves from the occupied areas must have been immeasurable. It was interesting, also, to glean opinions from the bomber crews of both sides.

The R.A.F. airmen were loud in their praise of the Americans. "If I had to fly the distances they do in daylight, I'd chuck my flight pay and dig myself a funk hole and hide for the rest of the war," was the general remark.

When the American airmen were walking home from the nearby villages and heard the R.A.F. planes going over at night, they would say, "Those poor devils. They have to go, night after night, no matter what the weather. At least we get a break when it is too bad, but not the R.A.F."

The First Wing continued to hammer away all through the fall and early winter of 1942, but their activities were somewhat curtailed that autumn when several squadrons were withdrawn to take part in the projected invasion of North Africa and a nucleus for the Twelfth Air Force was gathered in the Near East.

Between June and December 1942, the total number of combat groups in the U. S. Army Air Force increased from 114 to 167 and those overseas from 29 to 69. There were 33,304 aircraft in service which included 2079 heavy bombers, 3757 medium and light bombers, 5303 fighters, 468 reconnaissance planes, and 1857 transports. At home first-line aircraft such as the B-17, B-24, P-38, P-43, P-47, and P-51 were in high-figure production. At the same time the development of exhaust-driven turbo-superchargers for high-altitude operations added performance to both bombers and fighters.

The glory of the U. S. Army Air Force was just around the corner.

America's sudden propulsion into the war set up new problems and combat areas for the Germans. Now their U-boat forces had to shift out of the British area of approach and move farther west to strike at U.S. convoys heading for British ports. In the beginning the U-boats had concentrated on the waters adjacent to the British Isles. When British countermeasures made these areas too dangerous, they moved out into the convoy lanes. As antisubmarine patrols became even more effective, the U-boats moved farther afield, extending their activities to 49° west and as far south as Africa. By November the submarine activity off Newfoundland necessitated an increase in the number of U. S. Army aircraft stationed in that northern base. From Newfoundland it was but a relatively short distance to the coastal frontiers of the United States.

Once Germany had U-boats available for these waters, they struck with deadly effect. By late December 1941 enemy submarines were seen off American shores. In January 1942 they sank the *Cyclops* off

Nova Scotia and then torpedoed the tanker *Norness* off Long Island, an incident kept secret for a long time in the United States. During the next seventy-six days, fifty-nine ships with a gross tonnage of 350,000, went down in the Eastern Sea Frontier. In short, enemy submarines hunted with relative impunity along the American coasts and with such success that they threatened the entire U.S. strategy in the Atlantic.

By this time too, the American public was just beginning to realize the complete state of unreadiness in which this emergency had caught the nation. Although the German submarine menace in World War I lingered in the memory of Americans as the chief factor in their involvement in that struggle, and although for two years past a second German campaign had given repeated warnings that submarines would again be relied on to offset the weight of American supplies, when war came, no master plan existed to cope with the danger.

It was clear that the Atlantic would have to be viewed as a distinct theater of war and brought under a single directing agency, and all available resources concentrated to combat the submarine. The Army Air Corps Anti-Submarine Command was formed in October 1942—first as a somewhat temporary measure. It was made up of the 25th and 26th Anti-Submarine Wings.

Long-range B-24s were needed, but few were available. The U.S. ASV-10 radar proved to be most suitable for this work, for by this time the British ASV-2 had been compromised by German detecting devices.

Despite its responsibilities for most maritime operations, the U. S. Navy was forced to request assistance from the Army Air Force in antisubmarine patrols, which were inaugurated on the East Coast on December 8, 1942. By early 1943 nine B-17s and about one hundred other aircraft, mostly obsolescent and in many cases unarmed, were used in these duties by the First Bomber Command. They were assisted by observation aircraft of the First Air Support Command and the U. S. Civil Air Patrol. In March the U. S. Navy was able to take over full control of these units, as was the case in the Gulf of Mexico and the Caribbean. By May 1943 the Germans began withdrawing their U-boats from American coastal waters.

During the height of the submarine menace I spent some time with a Royal Canadian Air Force antisubmarine squadron based at Gander, Newfoundland.

One bitter night a sugar snow pelted through the light glancing from the hangar windows. Along the 1600-foot-wide runway a Flying Fortress rumbled uncertainly to its shed. Below the catwalk on which I was standing I saw Joe Viau's PBY Canso (the R.C.A.F. name for the U.S. amphibian flying boat) come trundling into its shelter.

In the Intelligence office—better known as the Chamber of Horrors—I watched the crew put through a routine interrogation. This happened every time a Canso patrol came back—if they did come back. The Intelligence office was a large room furnished chiefly with plain deal tables that were covered with army blankets. There were stacks of Intelligence data the German staff would have given a full squadron of bombers to inspect. Practically everything was tagged CONFIDENTIAL.

The eight men in the crew were weary with twelve torturous hours over the North Atlantic and were still burdened with their bulky suits and fleece-lined boots. I used to call them the men with rings around their ears, trade-marks impressed by the massive rubber-cushioned headphones they had worn so long.

There was a rumble of heavy chairs, the growl of benches, and the tang of strong coffee mingled with the perfume of newly lighted cigarettes. A sergeant air gunner was almost asleep and someone punched him into a more respectful position.

"All right! All right! Let's have it," ordered Flight Lieutenant Common, the interrogator.

"Well," Viau began from a standing start, "it was a routine patrol. We found the convoy at the point indicated. At about 08:35 hours I saw something off our port bow and went to investigate. I saw a white swirl and we ducked into the clouds, but it turned out to be nothing but a chunk of debris."

"Don't forget that anxious tug," one of the air gunners broke in.

"Oh yes. We picked up a tug and they signaled us, asking if we had seen a corvette. I replied in the negative and they asked us if we could help them out. I had to maintain a sweep, so I turned them down. We saw the corvette later."

"What was her number?" Common asked.

"X-22," Joe Viau answered quickly.

Common nodded. "Now the name of the tug."

"I know. I remember. It was the *Valor*. That's right, *Valor*."

"Good!" agreed Common, studying his papers. "The *Valor* was out there looking for a corvette."

Joe went on, "That's about all. It began to get thick and we went on instruments for about an hour. It rained for another hour and we had some icing. Then it turned to snow, but out farther we had good cloud conditions. I'd say it was a routine show."

Good conditions are when the cloud cover is down to about fifty feet off the water. They like it that way because if they do spot anything they can dart quickly up into the murk, approach unseen and attack suddenly.

While another Intelligence man was interrogating Sergeant McEnery, Viau's navigator for "lats and longs," the telephone bell tinkled from a special wall instrument. The Intelligence man took it and let out a restrained cry. Turning to us he explained, "Baldy's having an attack! . . . Give us the position, will you please?" he asked the Control office. "What . . . 41.10 west, 41.24 north . . . Good! Let us know what happens!"

Viau brought his own working chart across to me and placed a pencil mark on it. The attack on a German submarine was taking place at that very minute. I was somewhat disgusted because I had been talked out of going on that particular sweep.

Common and his aide gave up trying to interrogate Viau's crew. No one would sit down. Coffee was left steaming. They were all silently rooting—and praying for Baldy.

"This is what it is like when we have an attack," Joe whispered to me. "Everyone goes nuts!"

"I can understand that," I answered, "but how will he get back here in this weather?"

Joe said, "When we have an attack, we always come back—no matter what it's doing out there."

The Intelligence man grinned and put the phone back on the hook. "That's another for us. Baldy had a good attack. Believes the sub was destroyed."

Everyone cheered and a cup of coffee went over and slopped among the CONFIDENTIAL stuff.

Later on at Group Captain Larry Wray's bungalow I learned more about antisubmarine warfare.

"Our real problem," Wray explained, "is, first of all, weather. These boys go out as far as they dare and gamble on some good weather that was somewhere in Ontario when they left. If they draw the right cards, they get back safely. If they don't, we try to send them on to some alternate base. The weather may be open somewhere within reach. We may have to send them on to Montreal or to an airfield in Maine. In that case we can only hope that they have enough gas to fly that far. Sometimes they don't, and we get a case like that of Squadron Leader Wilson and his crew who floated about on an ice cake for four days."

"What about this guy Baldy coming in tonight?" I ventured.

"Oh, Baldy will be back. These kids are queer that way. They are all sub-crazy. They'll get back somehow, because it would mean they might miss a patrol if they didn't. I mean that. These kids won't go on leave if the hunting is good."

Then I went into the matter of aircraft range, which they simply did not have with the equipment available.

"You're right," Wray agreed. "That's our real problem. If we had a few American Liberators we could lap over the patrols, and the convoys would get air cover all the way across. I don't think we've ever lost a vessel in a convoy when we have been able to provide air cover. The trouble all begins beyond our working range. That's where the weather comes in again. If the kids have a good tail wind, they're out there in three or four hours and they can put in a lot of time making a sweep; but you have to remember that the same tail wind has to be bucked all the way back, and that often means ten or twelve hours in the air.

"If we had a few Libs we could get out much farther, spend a longer period in the submarine area and still have a good margin of safety. We're playing it too close this way."

"You could carry more depth charges too, couldn't you?" I said.

"Of course. When they have used up our present load, there's nothing to do but to come home. If they could carry, say, twice as many, they could make an attack and still be in the area to get a possible second. U-boats usually work in pairs."

We leaned against the wind and snow as we went over to the

officers' mess to get the story on Baldy. They said he was still up in the muck over the field somewhere, so I collected Squadron Leader William R. M. Griffiths, the control officer, Squadron Leader Ewart, and Flight Lieutenant Firstbrook the squadron adjutant.

"Who is this chap, Baldy?" I inquired. I had already built up a mental picture of a tubby guy with a high forehead; a cheery little bloke, too old to be flying fighters and only just hanging on to his medical.

"Baldy? Oh, he's just one of the boys," Firstbrook explained.

No one could wait until the ungainly Canso came lumbering up the ramp to the hangar entrances. The first bellows of greeting went up from the mechanics, which was answered by roars of defiance from the NCO members of the crew. Then a thunder of feet rolled up the stairs of the Intelligence office, for this crew had had an attack and all the weariness had slipped away with the release of the tension.

Baldy came out of the swirling mob and I sat speechless. He not only was not bald, he had the most beautiful head of hair north of the 49th Parallel, and was the handsomest boy I had seen in years. What did they mean, Baldy?

This subchaser was just twenty years of age, tall and straight as a ceremonial lance. He was Flying Officer D. G. Baldwin of New Orleans, Louisiana, which is how a mopheaded boy comes to be known as Baldy.

"It was a good attack, sir," he said to Group Captain Wray. "I think we destroyed it."

"We'll find out," Wray warned.

"We should have some good pictures, too," Baldy went on in a Westminster choir-boy voice. "We were extremely lucky, sir."

With most of his flying gear removed Baldwin was everything the wartime hero seldom is. He was pink-cheeked with excitement and his crew haircut that was growing in disclosed the natural wave he had tried to efface. Baldy had everything; perfect teeth, gay eyes, and a beautiful pair of shoulders.

"Let's have it!"

"We first saw him on the surface about five miles away." Baldy swung his long legs over the edge of a table where he had perched to make his report. "It was 41:24 north-41:10 west. That was the position. He was coming across our track which was 180-true at the

time and he was really cracking. I'd say he was doing between twelve and fourteen knots.

"Well, I went down after him and let go with everything. He had started to crash-dive before we got there and he was well under by the time we dropped the depth charges."

"I'll swear we got two direct hits on the sub itself, sir," Sergeant W. R. Morphy the first engineer added. "We banked fast and I saw the depth charges go in clearly."

"I'm glad to know that," breathed Baldy. "Anyway we got good eruptions on the pattern and then circled our sea markers and floats. In three minutes we saw a pattern of air bubbles that covered an area twenty-five feet in diameter. After circling the area for about an hour we noticed an oil slick—not very big—with a rainbow effect in the middle. Then it began to snow and we lost sight of our sea markers, so we started for home."

Flight Sergeants Landale and Thackeray, the wireless air gunners, chipped in with extra details which included data involving specific lengths, distances, and other measurements. They were most definite in their statements.

I leaned back and asked Griffiths, "How do they figure the distances so accurately?"

"It's a trick," Griffiths explained. "They use all the parts of the aircraft, such as the known width of the wing, or the distance across a certain window. Knowing these measurements, they have worked out a system of rapid computation, presuming that the pilot is sweeping back and forth at a specified height. It's simple and it is accurate enough for these reports."

I also learned that the depth charges were filled with a new explosive (probably RDX) which was said to be a great deal more effective than TNT. They were dropped in a predetermined pattern, and were fitted with hydrostatic fuses that exploded the main charge at a predetermined depth—usually about twenty-four feet.

Antisubmarine experts knew that enemy submarines dove at the rate of ten feet per second. Thus, it was a simple matter to compute the details of an attack if they had some surface evidence to work on, even though it was only the pear-shaped swirl left by the disappearing conning tower. The fuses could be set to explode at any

depth, and if attack conditions changed, the explosion depth would be altered to meet the situation.

It is upon all these facts that the Intelligence staff works to determine the success or failure of an attack. The interrogation goes on for hours and the evidence is measured, weighed and slide-ruled until there can be no mistake as to whether the submarine was damaged or simply driven off. The R.C.A.F. seldom claimed actual sinkings, but their Intelligence men would grudgingly admit that an attack was a success.

An oil slick in itself is not enough. A depth charge will rupture an outside fuel tank, but the damage will not prevent the U-boat from returning to its base, or to a friendly supply ship. Oil slick appearing so many minutes later and *after* a certain pattern of air bubbles is another matter entirely. Then it can be *presumed* that the depth charge had seriously damaged the pressure hull of the U-boat, releasing air which will come to the surface before the heavier oil from a hull tank. But all these things together must take place according to a set pattern, and within a certain time.

We went back to the officers' mess with Baldy and his crew. The bar was closed but someone had left two trays of drinks. There was a stack of sandwiches on a table and we sat down before an open fireplace to sink a few more U-boats.

I asked Baldy what he was doing up here in the R.C.A.F.

"Go ahead, Baldy," Nutter the co-pilot grinned. "Let's have the old hokum. Tell him how you saw the light and hurled your clean young body into the fray."

Baldy stared into the fire for a full minute, and then the Westminster choir-boy smile appeared. "No, it wasn't like that. It was . . . well, it was just that there were too many girls in my life, and this looked like a happy solution."

The Short Stirling, Britain's first true heavy bomber which was accepted by the R.A.F. in August 1940, was by this time reaching the end of its worthiness. It was not a beautiful aircraft, by any standard, but it filled the bill during a very trying time. It performed the task for which it was designed, but as enemy antiaircraft measures improved, its limited ceiling (about 12,000 feet) made it impracticable, and when considerable armor plate was added and the bomb load

increased, it was being flown at 70,000 pounds all-up weight, instead of the 50,000 pounds for which it was designed. Practically every take-off became a marginal operation since most Stirling squadrons were flying from grass fields that were often muddy.

The Stirling was powered with four 1595 hp Hercules engines and went through several revisions of design, and was flown with a variation of gun turrets. It had been built with an exceptionally long undercarriage, a feature that was adopted to accommodate a ventral gun turret, that, incidentally, was never fitted to any operational Stirling.

Although an ugly duckling of an airplane, it nevertheless had its days of glory. Two Stirling pilots were awarded Victoria Crosses while flying this machine.

On the night of August 12, 1943, Flight Sergeant Arthur Aaron, a twenty-four-year-old pilot from Leeds, was captain of a Number 218 Squadron Stirling that was raiding Turin, Italy. Aaron ran into a unit of night fighters which gave him a wild reception. Three of his four engines were badly damaged, the windshield was shattered, and the rear gun turret put out of action. The navigator was killed and other crew members were wounded. Aaron's jaw was smashed and part of his face shot away. In addition a lung was perforated and his right arm broken. He fainted and collapsed over the control column and the Stirling nose-dived to 3000 feet.

His flight engineer managed to gain some control and hold on until Aaron rallied. He then flew with his left hand and gave his instructions by hand signals until he got his bomb aimer to take over as the pilot. With a series of notes written with his left hand, Aaron showed the inexperienced crewman how to keep the ship in the air. He kept up this painful instruction until he got his bomber to an airfield in Bone, North Africa, where he even supervised the hazardous landing.

According to those who were on the field, Aaron might have survived his wounds, had he been content to rest, but he totally exhausted himself by carrying out his duty to the very end. He died nine hours after the battered Stirling landed. He was awarded the Victoria Cross posthumously.

The Stirling bombers, much overloaded, were never able to reach any great heights during the many long-distance raids on Italian

targets, and it was a standard yarn that they usually went *through* the Alps, rather than over them.

One November 1942 night, Flight Sergeant Rawdon Middleton of Number 149 Squadron, was one of the many Stirling pilots who went through the Alps to bomb the Fiat works at Turin. His aircraft refused to climb and the journey out was over a hair-raising path, flown through the ghostly peaks. This zigzag flying left Middleton critically low on fuel, but he continued on to the target and actually flew across it three times to make sure of identification.

It was during this persistent search that flak hit them, and a shell burst in the cockpit, shattered the windshield and wounded both pilots. A piece of shell opened up one side of Middleton's face, destroyed his right eye and exposed the bone over the eyebrow. He was also wounded in the body and legs. Middleton collapsed and the aircraft fell off to 800 feet before the second pilot, Flight Sergeant Hyder, regained control and released the bombs. The flak continued to pound at them, but Hyder had eased the bomber up to 1500 feet when Middleton regained consciousness.

He then ordered Hyder back to receive first aid, but the second pilot returned quickly as he realized that his captain had difficulty in seeing and could barely speak because of considerable loss of blood. Despite his wounds, Middleton then set a course for England and personally directed the aircraft on its hazardous recrossing of the Alps. Although the crew discussed abandoning the Stirling or landing in northern France, Middleton was determined to reach the English coast to give his crew a chance to bail out over home territory. He knew he had little chance of saving himself.

It took four hours to reach the Channel, but Middleton remained at the controls throughout the flight. As they crossed the coast the Stirling again ran into heavy flak and the badly wounded pilot used his remaining strength to take evasive action. With the bomber virtually out of fuel, Middleton flew along the English coast and ordered the crew to bail out. Five did so, but Sergeant Mackie and Sergeant Jeffery, flight engineer, stayed behind to help the sergeant pilot, but their efforts came to naught. The Stirling crashed into the sea and all three crew members were killed. Middleton's devotion to duty in bringing back his crew at the cost of his own life was recognized with the award of the Victoria Cross.

It was not only the pilots who showed such marked heroism. A flight engineer, Sergeant G. Fallon, a Canadian member of Number 75 Squadron, undoubtedly saved his aircraft from destruction during a raid on Le Creusot, France, in June 1943.

Just before the bomber, which was captained by Squadron Leader Joll, began its run-up over the target, a flak burst severed cables that controlled the fuel petcocks. These cables were inside the wings. Sergeant Fallon immediately grabbed an ax and hacked his way through the side of the fuselage and crawled into the wings.

Then, while Joll made three runs over the target, Fallon worked calmly sorting out and repairing twenty-eight cables under the faint beam of a pocket flashlight. He then insisted on remaining inside the wing to attend an oil leak, and the Stirling reached its base safely, thanks to Fallon's skill and quick thinking.

For the desert campaign of 1941-42 the British had gradually assembled a large and very efficient air force. In spite of Rommel's spectacular advances, this air fleet eventually won full control over the Western Desert. It was the Royal Air Force that prevented Rommel from annihilating the British Army and helped to stop him at El Alamein.

Many of our present day ideas concerning tactical aviation, were evolved in the heat of these desert campaigns. There is no doubt that the experience and unusual conditions modified many U.S. notions, and the present concept of tactical aviation was tried and proved in North Africa, Italy, and New Guinea.

Tactical aviation must have complete freedom of development. The Army may think of air superiority as an umbrella, but the Air Force must think of it as the foundation on which the whole structure of an air campaign must be based. In World War I tactical aviation was generally limited to reconnaissance and when the aircraft assigned to this mission had returned with the information, the enemy was free to harass the ground forces with little or no opposition. Air superiority, without the ability to carry out selected interdiction against enemy ground targets, is wasted superiority.

As was demonstrated in the latter months of World War II and in Korea, not even an armored thrust can secure its flanks or its communications without air support. Tanks succeed in their drive

just so long as unfavorable weather keeps enemy aircraft on the ground. After that, if they lack air superiority, they are quickly halted, isolated, and destroyed.

The Royal Air Force and the U. S. Army Air Force functioned as a unit in Africa and the Luftwaffe was knocked out of the skies over the desert battlefields. Air and ground commands of both countries were as fully integrated. The ground commander and air commander lived side by side in the same camp, ate at the same mess, planned and operated on equal terms in the closest possible manner. They both knew that only the long reach of air power could achieve a lightning triumph in Tunisia. The Tunisian campaign became another lucid demonstration of having an airman run the air war while a soldier runs the ground war, but always working together and co-operating for the final decision.

Early in November, Brigadier General James H. Doolittle was made commander of the new U. S. Twelfth Air Force operating in North Africa. General Bernard Montgomery's offensive, backed by a powerful air and tank attack, was opened on October 23, 1942. By November 7, General Erwin Rommel was in full retreat. The next day a large force of American and British troops landed in Morocco and Algeria and opened a new front in Africa. Rommel was in dire straits and had to evacuate Tripolitania, and late in January of 1943 had taken up positions behind the Mareth line where he received new reinforcements. His armies were now virtually back to back on both the eastern and western frontiers of Tunisia.

American bomber forces soon joined the necessary air operations that were devised to break down the stanch German resistance. The day after Christmas an interesting incident took place when a force of U. S. Liberators went off to bomb Bizerte and play havoc with the dock areas where one day Rommel would set up his escape route.

In order to better understand what actually took place, we will board a Liberator flown by Lieutenant H. M. Locker who flew Number 3 in the last element of the formation.

It is a beautiful day and the Libs drag long plumes of contrails as they fly east to swing past the docks south of the old town, just far enough to dodge the flak. As they wing north and turn west to pick up the target line, we can see enemy antiaircraft dotting the

sky and the greasy smoke sifting through the bombers of the first element. It will get worse as each element approaches the bomb-release point.

By now chunks of shells are zinging through the metal fuselage and the clangor is joined by yells of "We're hit!" but the pilot feels no particular change in the tug of the controls.

As we move over the target we see the bomb-release lights blink six times. That means we have dropped our six 1000-pounders.

Our Number 2 plane, dubbed the *Birmingham Blitzkrieg*, is just releasing its bombs. All air crews have a strange desire to watch the red-brown eggs spawned, but this time just as the first of the rack rolls free, there is a blinding flash and a terrific explosion. The tail section of the *Birmingham Blitzkrieg* seems to fly backward, then flutter down to the ground which is five miles below. The rest of that Liberator has been pounded to dust by a direct flak hit in the bomb bay which set off three tons of TNT.

Just as we gulp back our shock and amazement we find that we are in trouble ourselves. Our right wing tip curls up and about three feet has been broken off by the explosion. Our Number 3 and 4 engines are starting to flame and smoke. The rest of the formation has turned north to avoid the flak, but by now we are too busy to make any turns and we begin to fall back fast.

We have no choice, and straight down flak valley we go. The pilot manages to get the fire in Number 4 under control but Number 3 is stubborn and continues to blaze fiercely. There is nothing to do but feather that prop and hope we can get some power out of Number 4. Everyone aboard knows that eventually the fire in Number 3 will get to a fuel tank and that will trigger another explosion.

To add to our troubles, we are now being attacked by seven FW-190s, which are coming straight down through the flak. One of them blasts a two-foot hole where the Number 3 gas tank is located, and more flames shoot out.

"I have called for the P-38s to come and help us," Pilot Locker reports, "but I guess we're not getting through."

The enemy fighters continue to snarl at us from the rear and Locker orders everyone to get into his 'chute pack and be ready to go out. A 20-mm shell explodes on the instrument panel and both pilots are partially blinded. The same shell rang the parachute bell

and one crew member, known as Fozzy, goes out through the escape hatch.

Another crew member yells that we are afire in the bomb bay, the radio compartment, and in the waist. Locker orders everyone available to keep on fighting the fires, but to also keep an eye on those devilish 190s.

We have very little left to stay in the air with. The flak has stopped, but the fighters continue to rake us from stem to stern. A foggy mist comes in and we do a little instrument flying—without instruments—and gradually drop through that murk into a swath of glorious sunshine.

Suddenly the Liberator just quits flying and there is nothing for Locker to do but hope she holds together long enough for a belly landing. A patch of plowed ground comes into view, the throttles are yanked back, and we all get set for the shock.

It isn't too bad, and within seconds everyone is scrambling out of a hole and rolling out on the ground. The two pilots seem to have some superficial body wounds. Vandergriff has been plugged through both arms. We all help dress one another's wounds and then spot an Arab hut nearby. After a rest a native leads us to a British ground station where we are now able to chuckle over the various incidents of our "mishap."

We learn later that when Fozzy landed he was soon "captured" by three Arabs who debated whether to turn him over to the Germans or the British. He bought his way out of that with his pocket knife which he presented to one of his captors. Vendy, a waist gunner, tells us that he stood in a doorway thumbing his nose at the 190s when he ran out of ammunition. He figured that that was the least he could do. Gowan says he used up five fire extinguishers trying to put out a batch of flares that caught fire. He finally tossed the burning flares into the empty ball turret—and poured water on them—which seemed to do the trick.

Sometimes they came home, sometimes they were delayed on the way. Usually, the bomber crews had a rare tale to tell, and the above is typical of those historic days.

MILITARY AIRCRAFT OF THE SOVIET UNION (1939-49)

Compiled from material provided by Dr. Denys J. Voaden

Fighters

TYPE	ENGINE	TOP SPEED	ARMAMENT
LA-11	ASh-82FNV 1850 hp	402	Three 20-mm cannon
LA-15	R.R. Nene 5000 lb. S.T.*	640	Two 37-mm cannon
MIG-9	Jumo(2) 1980 lb. S.T.*	585	Three 37-mm cannon
MIG-15	R.R. Nene 5000 lb. S.T.*	659	Two 37-mm cannon Two 12.7-mm guns
YAK-9P	VK-107A 1600 hp	358	Two 20-mm cannon Two 12.7-mm guns
YAK-17	Jumo 004B 1980 lb. S.T.*	520	Two 37-mm cannon

* S.T.=Static Thrust.

I-153: A development of the earlier I-15bis but had retractable undercarriage. Very maneuverable but rarely used after 1942.

MIG-3: Another in the line designed by Mikoyan and Gurevich. Powered by liquid-cooled AM-35 engine. All MIGs were capable for good altitude but primitive in cockpit comfort.

LA-5: A development of the LAAG-3 designed by Lavochkin, Gudkov, and Gorbunov. This aircraft was powered with the M-82 radial engine and first appeared at Stalingrad late in 1942. Early models had cockpit faired neatly into the fuselage and later were fitted with all-around vision canopy.

LA-7: This was a further development of the LA-5 but with a variation in wing design. This model was used after World War II by airmen of the Chinese Socialist Republic.

YAK-1 to YAK-7b: These aircraft were put out in various formats. The YAK-1 entered service late in 1940, and was then known as the I-26. They were light but fast mounts. The YAK-3 was brought to international attention by the pilots of the Escadrille Normandie-Niemen and a number were taken back to France in 1945. The YAK-7b model was probably the finest of the breed, and first fought at the Battle of Stalingrad. It was from this that the YAK-9 was eventually developed.

Bombers

TYPE	ENGINE	TOP SPEED	ARMAMENT
IL-10	AM-42 2000 hp	280	23-mm cannon and several variations of rocket pods and bomb stowage.
IL-28	R.R. Nene (2) 5000 lb. S.T.	605	Many armament arrangements
PE-2	VK-105R (2) 1100 hp	335	Carried four 550-lb bombs
TU-2	ASh-82FNV (2) 1850 hp	357	Carried 5000 lb. of bombs
TU-4	Wright R-3350(4) 2200 hp	219	Copy of U. S. Superfortress

TB-7: This was later called the PE-8 and as a four-engined monoplane of long range was flown first to the United Kingdom and later to the United States carrying Molotov. Now in general use for civilian aviation in Arctic regions.

IL-2: This was the famous *Shturmovik* designed about 1940 by Il'yushin. Seen in service at the outbreak of the war. Late in 1942 was modified from a single-seater to a two-seater. Not too fast but was well armored. Its specialty was firing rockets at enemy vehicles from small launchers set under the wings.

IL-10: A refined development of the IL-2. Entered service in 1944 showing more sweepback to the wings and fitted with a more powerful engine. It has been used by several Soviet satellites since 1945 and a few examples were captured in Korea.

DB-3: This aircraft along with the DB-3F made up a new class of Il'yushin bombers powered with twin radial engines, which first appeared about 1938. Some carried torpedoes.

YAK-4: This plane probably originated as the BB-22 about 1940. It was a fast twin-engined bomber, but very few were built.

Lend Lease Aircraft

The following were provided in good numbers by the U.S. and British governments and were used by Russian airmen.

United States: AT-6, AT-19, O-52, B-25, B-26, A-20, B-24, B-17, C-47, P-40, P-63 and P-47.

Great Britain: Spitfire, Hurricane, Walrus, Mosquito, Albemarle, and Hampden.

[1943]

OVER THE PAST DECADE the war novelists and military historians have written reams of prose eulogizing the men who made up a bomber crew. Some of it has a faint ring of authority, but much has been spun to the tapestry of the Arthurian legend and is false. Some writers who have been successful in this art form have never heard a battle shot fired, to say nothing of having lived through a combat mission. By the same token there have been instances where the author, unshackled by technical details or facts, has turned out most intriguing prose. If these passages are published often enough, they eventually become the gospel of the service, and with the years even the participants believe that was how they lived.

The classic example can be found in the popular Hollywood presentation of life and customs in a World War I squadron where night after night despondent airmen tossed expensive champagne goblets into a fireplace after stumbling drunkenly through, "*Stand to your glasses steady!*"

Where that beautiful glassware came from was never explained, nor how there was a baronial fireplace in every Nissen or Besseneau hut. Today, however, fellow veterans of that campaign swear that they remember those showers of crystal and will weep quietly every time they view that old counterfeit, *Dawn Patrol*.

Life in a World War II bomber was considerably less than romantic. It was computed in periods of but a few hours, or possibly minutes. It was an existence composed of a succession of trials, dreads and fright, leading to a deliverance from the particular hell of

the moment. Antiaircraft fire, a failing engine, telltale contrails, enemy fighter attack, or the failure of an oxygen line, all contributed to the individual nightmare.

Each man had his own particular hell to endure over four, eight, or ten hours. He was always cold, generally hungry, fear-stiff, ignorant of what was going on around him, and never fully convinced that life was to continue, until he felt the bump of the wheels on the home runway.

In all those hours there were subdivisions of dread or hope. There were the joyous minutes when a gunner might fire a few savage bursts at an enemy fighter, the time when a navigator was able to concentrate on the ever-present problem of position, the short period when the co-pilot had the honor of taking over from the plane's captain, a few pleasurable minutes when the flight engineer or radio man could offer some mechanical determination or message. All this made up a fragile chain of existence between take-off and return. Daily success was always tempered with the knowledge that if they lived out today, they would have to go again tomorrow—weather permitting. Probably no human effort in military history tried the souls of ordinary men, as did the long-distance bombing raids of the Second World War. It was a trial that only Allied airmen knew, day after day, for the enemy was content to adopt a defensive role, always fighting over his own friendly area.

The captain, or first pilot, carried the burden of responsibility, hour after hour, mission after mission. He had to be a first-class airman, but more important he had to have the courage of belief in every member of his crew. His was not simply the task of flying the bomber to its target and getting it back home again. He was captain of the aircraft and had to make every important decision; decisions that ruled whether his men would live or die. He had to know his plane from stem to stern. He had to know how to handle it under a hundred different emergency conditions. There were times when he and he alone could decide whether to continue the mission when all odds were against him. When a patrol was aborted for any reason, the captain had to assume the responsibility for every excuse or explanation. On the face of his behavior the whole crew could be listed as first-class, or a mob of chickenhearted wastrels.

In the air the first pilot did most of the flying. He had to know

exactly what could be expected from every throttle or manifold-pressure setting. He was master of a console that would have baffled a veteran organist. His cockpit was set in an upper level reached by a trap door between his and the co-pilot's seat. Both men were walled in by curving banks of instruments. Half a hundred telltale dials winked on the main panel. In a central stand below were the throttles, turbo levers, mixture levers, and propeller-pitch handles. All of these gadgets were exasperatingly alike in shape, color, or arrangement, and it took months of cockpit time to differentiate between the controls or dials of one engine or another. A maze of equipment, including the automatic pilot setup, was fitted just forward of the trapdoor. Each pilot also had control panels set at inconvenient levels beside him, and there were banks of radio-tuning apparatus in the ceiling above; all in all there were some one hundred and fifty dials, levers, switches, indicators, cranks, handles, knobs, and buttons, any one of which might play an important part in their continual battle with fate.

The plane captain had to know the effects of all meteorological conditions, how to nurse a weary engine, a faltering propeller, or a treacherous fuel system that threatened to dump them all behind enemy barbed wire. He had to be something of a physical and mental marvel, for along with his mechanical knowledge, he had to fly a multi-ton bomber over hundreds of miles, while taking evasive action or fighting inclement weather conditions. It took brains and brawn, particularly brawn, for there was no delicate fingertip flying in a Fortress, Wellington, Liberator, or Lancaster. It was brute force, applied to a wheel and rudder pedals, hour after hour. Even pushing or pulling a quartet of engine throttles took more than a classical gesture of an artistic hand. Every control aboard a heavy bomber demanded brute strength to actuate it, and required hours, weeks, and months of continual practice to retain the touch that kept a bomber in its formation. Most of the time it was comparable to operating a bulldozer, and only a handful of men in each squadron ever learned to fly these aircraft without becoming physically exhausted after several hours of this torment.

Unbelievably, the co-pilot had an even worse assignment. He had the same training as his plane captain, but until he had lived through a certain number of long-distance missions, he could not move over

to the left-hand seat and take a command. He was, nevertheless, expected to assume that responsibility at any instant, should the first pilot be killed or wounded. When such an emergency arose the plane was usually damaged and the co-pilot had to prove himself with a piece of unserviceable equipment.

Under normal conditions, the co-pilot had to do all the preliminary paper work before the flight, and all the pre-flight tests of the aircraft. He had to know the answers to any question the plane captain, navigator, or bombardier put to him, and it was he who usually had the full details of the briefing at his fingertips. He was expected to know or remember the myriad facts of the weather report, the expected flak areas, the intricate data and figures concerning the approach to the bombing run, and then when the bombs had been released, to have the assembly data, on the tip of his tongue, because that sheet was usually lost in the confusion over the target. In other words, he covered for every other member of the crew, and played it safe by knowing and remembering every detail of the original field order.

During the flight in or out, the co-pilot had to remember a hundred factors concerning the operation of the aircraft; the first pilot had been given all that information but he still relied on the co-pilot's memory, if only to check out his own knowledge or decisions. The Number 2 pilot had to know how much fuel had been taken on, or the details of the fuel-line system, without minute-wasting contemplation. If the mission was successful and the bomber returned safely, the plane captain was given full credit for the performance. Generally speaking, the co-pilot had just gone along as a passenger—in case of an emergency.

Another heroic and little publicized member of the bomber crew was the navigator. On cursory consideration it is assumed he was skilled in navigation and that his job was just that. To the uninitiated it may seem that since the bombers went out in great formations, navigating to the target and back again, was simply a matter of following the mob.

Far from it.

The navigator was supposed to know at all times exactly where the bomber was, should the pilot decide to make an immediate return because of damage to the aircraft or serious injuries to mem-

bers of the crew. To do this he had to know his present position in order to chart a course for home, and his minute calculations were usually made under frenzied conditions, at temperatures well below the zero mark, with his hands encumbered with heavy gloves. Those of us who have difficulty with the simplest mathematical exercise under normal classroom conditions, can have no idea of the problems of the wartime navigator.

He was also skilled in first aid and often assumed the duty of the plane's physician and whenever a crew member was wounded he was usually hustled into the navigator's compartment where he was wrapped up for warmth and attended by the navigator or radio man. Amid all the confusion, the slip-stick operator had to keep his head and know his position exactly so as to make a rational report on the mission when they returned to the base. The "lats and longs" information that was demanded immediately on landing, usually played an important part in the over-all consideration of the effects of the raid.

The radio man was another little known individual, but he too was most important in this high-flying team. He was the liaison man between the home base and the pilot, and he was expected to maintain this line of communications under all circumstances. If enemy gunfire forced them to make a hurried return, the radio man was expected to advise their base, set up all arrangements for air-sea rescue operations, find out where there was a suitable landing strip, or the weather conditions in any given area. He had to work fast and with accuracy under these conditions, and was often responsible for the safety of the whole crew.

During mid-air action, the radio man generally took over one of the gun turrets, and fought enemy fighters. Too, he might be responsible for the oxygen check by keeping in touch with every member of the crew to make certain he was still getting the life-giving air. A slip-up in his vigilance might mean the life of any man on the team.

The flight engineer was another unsung hero of the heavy bomber crew. His duty was important and demanded deep concentration, mechanical skill, and a broad understanding of internal combustion engines. It was the flight engineer who stood behind the pilots—figuratively speaking—and guided their hands in the manipulation of all flight controls. It was he who made the fine adjustments that

drew every ounce of power from each gallon of gasoline, and whose sage judgment often brought the aircraft through when there appeared to be no hope in any of the dials before the pilots. The flight engineer nursed ailing engines, ruptured fuel cells, and adjusted the fine tuning of the engines and propellers when all about him was confusion, doubt, indecision, and build-up of a hopeless situation. When the plane captain and co-pilot had reached the end of their resources, it usually was the flight engineer who sat down before the master panel, checked out every possibility, and applied the remedy that brought power to the props or response to the flight controls.

Other than that, his job was undramatic and colorless. When matters were all clear on his panel, he might take over a wounded gunner's turret, help repair a silent radio, check the plane's heater system or move about the fuselage to make certain all was well in other departments. In case of a ditching, the flight engineer usually took over the assembling of the crew, the jettisoning of guns, spare parts, and any equipment that could be dispensed with in the emergency, and he then supervised the launching of the all-important dinghies.

If a thirty-mission tour of duty was completed safely, few ever remembered the quiet individual known as the flight engineer, but his role in the team was incalculable.

The bombardier's job is difficult to explain. As his title indicates, he is the crew member who releases the bombs above the target, but his role is not fully appreciated for it would seem that he is gainfully employed for only a short time, and while flying out to the target and returning, there is little justification for his being aboard.

Precision bombing is a science that requires much skill and patience. The bombardier is trained in the use of a number of intricate instruments, and in particular, in the art of self-control. Many bombardiers had once been pilot candidates, who for one reason or another had been washed out, but since they had absorbed a great deal of aviation training and many hours of flight, they were often induced to become bombardiers and in that way attain their commissions.

Besides being the important man during the run-up on the target, and the crew member who actually released the bombs over the aiming point—the ultimate goal of the mission—he was also trained

in that phase of ballistics that involved all types of bombs, explosive charges, detonators and bomb-release mechanisms. It was he who, on receiving the field order for the mission, supervised the selection and loading of the bombs. He was responsible for the proper stowage to maintain the correct center of gravity, and he had to make sure each bomb was unarmed on loading, and properly armed—the detonators set so that the bomb would explode on impact—before it was released.

In the flight out to the target the bombardier manned the guns in the nose of the plane and also kept a check on the route being flown to make certain the pilot would arrive in the target area headed in the right direction to hit the aiming point. He continually checked for drift, the forecasted wind, and other meteorological data that might have an effect on the precision of the attack. Then, for a few anxious moments, the bombardier was in complete charge of the aircraft; the pilots, navigator, and flight engineer obeyed his every word. As he kneeled over his bombsight he needed the full co-operation of nearly every man aboard. The pilot had to have the courage to fly a straight course, even in the face of heavy antiaircraft fire, or the bombardier's calculations and skilled aim would be thrown off. The co-pilot had to be ready to take over at any instant. The flight engineer had to make certain the engines were providing the speed the bombardier required. It was at this critical moment that the sure weld of the crew was fully appreciated, but such a bond could be enjoyed only when every member had complete faith in the man responsible for releasing their bomb load.

The success of the raid relied on his touch, skill, self-control, and determination. If he was careless, slipshod, forgot to arm the bombs, if he hurried the release in order to be rid of the explosive and get away, or if he allowed his personal concern and emotions to rush or delay his ultimate action, the work of the whole crew would have been squandered.

A good bombardier is worth fighting for.

The air gunners were also important members of the bomber crew, if they took their duties seriously, but many of them applied for air-gunner ratings for the additional flight pay. Their early training in the security of home areas was an interesting and not hazardous period of service. To learn the intricacies of the weapons and turrets

was not too demanding, but one feature of their training they often ignored or did not take seriously—the identification of enemy aircraft.

In these intensive sessions, black-and-white pictures of Allied and enemy aircraft were flashed on a screen for a few seconds to teach these students how to recognize them under various conditions. Much of the time in these classes must have been spent in day-dreaming, since few U.S. air gunners, when they were assigned to crews in Britain, could tell a Spitfire from an Me 109.

When the author first arrived in London to cover the activity of the U. S. Eighth Air Force, combat crews begged him to write articles denouncing the slipshod attitude of some careless air gunners.

"My god!" a young sergeant complained, "These kids now coming over, haven't the slightest idea what an Me 109 looks like. They shoot at anything with a single cockpit, and then explain lamely that they hadn't been taught much about identification of enemy aircraft. The truth is, they probably slept through those training sessions, figuring it wasn't important. All they know is to look for something with black crosses on it, but you don't see the black crosses until it is too late. Get these guys on the ball, will you?"

On the other hand there were many heroic gunners who more than earned their pay. A well-trained gunner was worth his weight in gold, but there were not too many in the British or U.S. services. It is difficult to explain why, unless we consider that so many were drawn from various levels of society, it made efficient duty standards awkward to establish.

It was my impression that air gunners of World War II were often a frustrated lot. They seldom received credit for enemy aircraft that they had claimed, and although they were awarded Air Medals and multiplying oak leaf clusters, there was little possible advance and practically no chance for commissioned rank. They flew almost daily, but did not share in the over-all responsibility of the mission. They sat in on general briefing sessions, but were seldom included in important planning consultations. They were not a part of the officers' club social sphere, although their pay, unencumbered by the various charges and dues borne by the officers, put them in a very pleasant financial position. They lived in noncommissioned quarters, but ate their meals in the "combat mess" where the food was usually superior,

and prepared to provide the best nourishment for high-altitude activity.

A first-class gunner was a jewel; he not only defended his aircraft with skilled gunnery, but he could play many a role that added to the teamwork of the crew. In most instances, gunners were gay and lighthearted and contributed most of the humor and diversion; the humor was sometimes crude and profane, but delicacy of thought or understatement made little impression in those days. In many cases there was a tight *esprit de corps* among the gunners that was communicated to the eventual success of the whole crew. Their lot was not enviable for they performed almost anonymously in an era when war heroes were headlined day after day; but it will be seen that if the heavy bomber crew was to survive it had to attract a variety of types.

The list demanded the cool, calculating man, the dedicated airman, the gay soul who leavened the austerity; men devoted to their jobs, and others who were devoted to each other. Flying skills were not enough. Personalities, and men with imagination could play a big part in cementing the bond, but more important it required a body of men who could do their particular jobs in the face of a mathematical table which said that 4 per cent of them would not return from any given mission. Thus, after twenty-five missions, the over-all loss was equal to the entire force that started the period.

In the middle of 1942 when the VIII Bomber Command was incredibly small, it was almost collegiate in spirit; scarcely one hundred air crews were overseas, and considerably less than that number of aircraft were available. As a result, personalities stood out in pure clarity, not only among the fliers, but among the aircraft. There was a time when Fortresses such as *Boom Town*, *Rose O'Day*, *Hell's Angels*, *Southern Comfort*, *Dry Martini*, and *Wahoo* were as well known in public print as the nicknames of big-league baseball players.

But as the flood tide of replacements and new airplanes came rolling in, individual identities—especially among the bomber squadrons—began to fade. The attention of the war correspondents turned to the activities of the fighter pilots.

In North Africa the battle for the Mareth positions began with an

air blitz on enemy airfields, and prior to the attack by the British Eighth Army, the U. S. Desert Air Force concentrated on these bases. After the strength of the German Air Force had been reduced, U.S. northern and central air units operated exclusively against the Luftwaffe, which relieved the R.A.F. Desert Air Force and the Eighth Army from any concern about German opposition, and left Air Vice-Marshal Broadhurst, (now Air Chief Marshal Sir Harry) who was in command of the Western Desert Air Force, free to use hundreds of bombers and fighters to search out enemy concentrations, and to operate with great effectiveness with the ground units of the Eighth Army.

During a crisis before El Hamma, U.S. tankbusters were sent into action; the enemy broke and retreated, and the 146th Panzer Grenadiers Division was caught moving on a road and put out of action by a devastating air attack.

After a short pause, the Eighth Army attacked at Wadi Akarit, and again air units in the north and center concentrated on the German establishments, leaving the Desert Air Force free to work at maximum intensity on the German forces moving back to the Gabes Gap. Once more the Germans retreated—this time at a speed quite unexpected—to a semicircle of strength curving from Bizerte to Enfidaville. At this point it was the duty of the Western Desert Air Force to entice away what was left of the enemy's air power, while the Tactical Bomber Force lent its strength to the attack being made by the British First Army and the U. S. II Corps.

The battle for the capture of German units in Tunisia began, not on April 22, 1943, when the ground forces pushed off, but four days before when ninety U.S. bombers were sent against the German airfields. The Luftwaffe was reduced to relative impotence by the dawn of the twenty-second; one hundred and twelve enemy aircraft had been destroyed.

This period also saw the spectacular destruction of twenty-nine Me 323 six-engine transports. These giant troop-carriers were hauling the equivalent of a complete German regiment into Tunisia. The weight of daily attack was also heavier than any air force had ever delivered in collaboration with an attacking army. During the final drive on May 6, the U.S. forces flew 2146 sorties, the majority of which were bomber, bomber-fighter, or strafing missions, on a six-

thousand-yard front. They blasted a channel from Medjez-el-Bab to Tunis.

The stage was now set for the move across the Mediterranean to Sicily and Italy.

Although the weather was not co-operative the U. S. Eighth Air Force gradually stepped up its bombing attack on German-held Europe. America's first full-scale raid was made on January 27, 1943, on the U-boat yards at Wilhelmshaven. A British reconnaissance plane had spotted the pocket battleship *Admiral Scheer* in drydock on the north side of the Bauhafen, and the naval dockyards were busy building new hulls and superstructures. It was decided that the VIII Bomber Command should join the R.A.F. in a daylight attack on this important base in the German homeland.

Over the months in 1942 the R.A.F. had inflicted considerable damage on the town itself, and had blasted a naval munitions depot out of existence, but some of the U-boat ways, shipyards, and drydocks had escaped. It was an ideal opportunity to demonstrate the effective collaboration possible between area and precision bombing.

Important news was also being made in other war spots; the Russians reported the imminent defeat of the German forces trapped at Stanlingrad, the British Eighth Army was moving on Tunisia, and from Casablanca had come news of the "unconditional surrender" policy of Roosevelt and Churchill. Everywhere in Great Britain there was a lively feeling of "let's get on with the war, and get it over."

On January 27, the weather was no bargain and at high altitude the cold was intense. The knifelike temperatures took a heavy toll of men and machines. Guns froze up, turrets jammed, censors clogged, windshields fogged and bombsights refused to work.

Fifty-three U.S. bombers attacked the installation, delivering their bombs through a film of cloud. The first set of the control panel failed and the tail fin was hit inside the fuselage target below the cloud layer. The flak was heavy.

Then more than fifty fighters, including Mustangs, rose to meet the bombers. They had lost control of the prop, and Southern gunners claimed later to have shot down a Mustang. The pilot realized that if he hoped to do it alone with a crippled

According to official reports, the bombing was only fair. Clouds hid much of the target and the photographs showed very little. It was noted, though, that while the pattern of hits showed some improvement over previous raids on France, the placing of the patterns still left much to be corrected.

Three bombers were lost over Wilhelmshaven. One, a Liberator, was lost in a collision with a Focke-Wulf that had been shot down by another bomber; an incident that the author witnessed several times in World War I, but in World War II it apparently was a rarity.

The losses, and the question of which airplane had been the first over German territory were the chief topics in the various officers' clubs and combat messes that night. Pilots of several of the wing planes that had skirted the islands, as the formation swung along the coast, argued long and loud, but the honor was awarded to the lead plane, piloted by Colonel Frank Armstrong and manned by an all-American crew that represented eight states and the District of Columbia.

The locks leading to the protective basin of the Saint-Nazaire U-boat base were attacked by American bombers. This time the weather was good and the bombing accurate, although the locks themselves escaped damage—a mathematical improbability that sometimes happens under such circumstances. In this affray, enemy fighter pilots introduced a form of warfare that was resurrected from World War I, dropping fragmentation bombs on the raiding Forts—not air bombing—and in the action eight American aircraft were days bereft. Whether all of them were downed as the result of this airfields. Term of attack was not made clear.

dawn of the later another form of air-mine made its appearance over had been destroyed. It seemed to be somewhat larger than a shoebox

This period also sent aircraft guns into the bomber formations, and Me 323 six-engine transport a small parachute. Several of the raiders collected the equivalent of a ceding bombs and were seriously damaged. weight of daily attack was added as a gaudy chapter to the delivered in collaboration known as *Southern Comfort*. After weeks of drive on May 6, the U.S. Liberator started a sizzling career which were bomber, bomber French target. On that occasion her crew brought her back safely, but over Wilhelms-

haven *Southern Comfort* again kicked up her heels and gave the boys an exhausting afternoon.

(It was on this mission that a number of accredited news correspondents, who wryly called themselves "The Writing 69th," were permitted to go on an actual raid, and Robert B. Post of the *New York Times* was lost, presumably shot down during the action he had gone out to report.)

The bombardier on *Southern Comfort* had released six bombs when the aircraft shook and stumbled with the thud and concussion of a hit. With that the bombardier got rid of his four remaining bombs on the docks below, and then turned to see what had happened. A 20-mm shell had exploded in the nose, and he fully expected to find the navigator dead, or a severe casualty.

But the slip-stick lad was alive and apparently uninjured, although the shell had exploded less than three inches away from his head and dented the steel helmet he was wearing. The concussion slammed his head down on the navigation table which splintered under the impact. The only ill effect he suffered was that for about twenty minutes he could not concentrate on calculating the course, and during this time the bombardier handled the navigator's gun, as well as his own.

Next, one of the waist gunners reported, "Our Number 3 engine has been hit and is spurting quite a lot of oil." An inspection disclosed that considerable lubricant had spread back over the wing. A tongue of flame flicked out, so the co-pilot closed the cowl flaps and actuated the fire extinguishers. The fire seemed to be doused, but the propeller started to windmill and chew away at portions of the engine cowling. The friction of metal threw sparks that bounced off the oil-covered wing.

But *Southern Comfort*, the baggage, had more tricks up her raveled sleeve. At this point the pilot noticed that the rudder pedals brought no response and someone discovered about four feet of the control surface had been shot away. The intercom buzzed again and the tail gunner reported that another shell had exploded inside the fuselage a short distance behind him.

There was no time to consider the damage. They had lost considerable speed by the drag of the windmilling prop, and *Southern Comfort* was soon left in the lurch; the pilot realized that if he hoped to return to England, he would have to do it alone with a crippled

ship and no formation support. The loss of the supporting guns of the other aircraft was serious, and to evade enemy fighters the pilot would have to fly due north and put as much sea between *Southern Comfort* and the Focke-Wulfs as possible.

Meanwhile Number 3 engine was vibrating and the wild prop continued to gnaw great chunks out of the damaged cowlings.

Once they were well out over the North Sea, the pilot is said to have made an announcement which may be apocryphal, but it was typical of the spirit of the times, "Those who want to, please pray!"

Land was sighted a short time later and they hoped it was England, the base of warm beer, Brussels sprouts, Piccadilly commandos, and Nissen huts, but it must have looked good at the time. An inquisitive Mosquito spotted the *Southern Comfort* and eased in to have a look. The crew could see the British pilot shake his head at her battle-scarred condition.

She landed with a gaping hole where her rudder should have been; her nose section was badly shattered, and both wings were perforated with flak and shell-gun holes, some as large as a grapefruit. One by one, the crew climbed out—not one of them injured—and reported that they had made a fairly good attack.

During a bombing raid on Rotterdam *Southern Comfort* racked up an epic of misfortune. Many other Forts and Libs experienced similar troubles, but space prevents their inclusion.

On this day her tribulations began when she was on her way to Rotterdam and was attacked suddenly by a number of enemy fighters, while well out over the North Sea. In the latter stages of the fight the radio operator reported that the ship was on fire. He was handling his gun when he saw the rudder hit, and when he studied the situation closer, he found that the fire was located between number one and number two engines behind the vents inside the wing.

Once the enemy attack had been driven off, the pilot turned back for the English coast. A solid overcast swallowed the old Fort, and the fire, apparently licking up lubricating oil, showed more persistency. Most members of the crew had had considerable experience with this blatant wench, and they knew there was plenty of time to make plans. They gathered in two groups, one around the navigator's escape hatch in the forward end of the fuselage, and the other about the door at the rear.

The plane started dropping down fast from about fifteen thousand feet. They were still on instruments and unable to see anything below. The navigator stuck to his post and tried to figure out when they would be over the English countryside. The wing showed signs of buckling, so the pilot decided "that all God's children ought to have wings." He punched the alarm bell.

The radio operator was sending S.O.S. messages, but getting no answer. When he turned and saw everyone diving out through the hatch, he screwed down his key and followed suit. The pilot went out last, or so he thought, but he had missed noting that the left waist gunner had waited to change his parachute. When the gunner discovered himself in a pilotless and deserted airplane, he went out head first.

As the bombardier drifted down, his main idea was to get back to the base before his hut mates divided up his goods and chattels. "I could see one of them wearing my bathrobe, and while I reflected on that, I hit into a tree. I looked down and saw a number of determined-looking people waiting for me. They turned out to be okay, once they found out which side I was on."

Three of the gunners came down together, one with a five-foot rip in his parachute, and fortunately landed just off the perimeter track of a British airfield near the coast. The waist gunner was in agony with a frozen face and somehow had lost his flying boots when his 'chute snapped open. He was dragged through some thorny bushes and into a muddy brook.

The bombardier and other waist gunner flopped into a swamp, and the bombardier's 'chute pulled him along for two hundred yards before it collapsed.

The navigator and radio operator came out of the clouds over a broad estuary and dropped into the water at the exact moment that a brand-new Air-Sea Rescue launch was cruising the inlet on a test run. As the two Americans hit the water the launch chugged up beside the gunner and hooked him out. The navigator was rescued a minute later.

The only fatality was *Southern Comfort's* top turret gunner who apparently slipped out of his parachute harness as he neared the ground. The burning airplane circled a small village three times and

then thoughtfully crashed in an open field, the last considerate act of this redoubtable wench.

Early in March the VIII Bomber Command set out on its first deep-penetration attack, a mission aimed at the Hamm marshaling yards which directed the production of the Ruhr industries to the east and north of Germany. The target lay about one hundred sixty miles inside the outer ring of Nazi defense. Seventy-one aircraft took part, but only one group of sixteen found the target. Two other groups that were hampered by inclement weather, bombed the shipyards at Rotterdam, and a fourth group returned to the base with its bomb load.

The little force which finally penetrated the murk and enemy defenses, was led by a twenty-two-year-old major, who brought back a record of almost perfect bombing.

His decision was worthy of older and more experienced leaders. After losing contact with the accompanying Fortresses in the murk over the North Sea, the young squadron commander considered whether he should attempt to complete the mission with only sixteen bombers. The weather was wretched, the German coastline could scarcely be seen through the haze, he had no idea where the others had gone, and he wondered whether the mission had been scrubbed. He checked his small force again—sixteen Fortresses bearing one hundred sixty crewmen against the best defenses of the enemy. Hamm was an important target. The other groups had evidently headed off for a less difficult area, and if he turned back, simply as a cautionary measure, his decision would not be questioned.

Instead, he elected to go on and thereby brought daylight precision bombing one step nearer the U.S. goal. Their bombs were dropped clean and in pattern, and subsequent reconnaissance photographs showed an excellent concentration among the railroad shops and marshaling yards.

But the mission was not carried out without loss. Intense Messerschmitt opposition and flak barrages, both going in and coming out, accounted for four of their aircraft, but the claims of sixteen enemy fighters destroyed helped to even the score.

Encouraged by this sixteen-plane mission, an attack was planned for March 8 on Rennes, also an important marshaling yard through which the Germans routed supplies for their Brittany bases. Fifty

Fortresses pounded Rennes from end to end with 500-pound bombs.

Ten days and three attacks later, Vegesack received a decimating blow when seventy-three Forts and twenty-four Libs were sent against the shipbuilding yards that lined the Weser some few miles north of Bremen. Two hundred sixty-eight tons of high explosive were dropped on the yards of the fourth-ranking producer of U-boats. The very heavy damage reported included the complete destruction of the works, powerhouse, shipbuilding shops, and the severe battering of a number of submarines being built on the ways. Only two bombers were lost on this most successful American attack to date, and the air gunners claimed to have shot down fifty-two opposing fighters.

When a complete assessment of the damage had been made from the reconnaissance photographs, Ira C. Eaker, the commanding general of the Eighth Air Force, announced, "The men and the machines have proven themselves." Winston Churchill sent a message to the commanding generals of the European Theater of Operations and to the Eighth Air Force: "All my compliments to you and your officers and men on your brilliant exploit, the effectiveness of which, the photographs already reveal." Britain's Chief of Air Staff, Lord Portal, also sent his congratulations.

Half a world away Captain Joseph J. Foss was winding up a glorious air-war career. Between October 13, 1942, and January 15, 1943, this South Dakota firebrand destroyed twenty-six Japanese aircraft, equaling the mark set some twenty-five years before by Captain Eddie Rickenbacker, America's Ace of Aces in World War I.

It was the author's good fortune to meet and interview Captain Foss at the Waldorf-Astoria in New York City shortly after he was taken out of action and sent back home. His story was a boost to national confidence at a time when it was sorely needed.

He was the typical farm boy who loved to hunt, but he also had his eyes in the skies. In his teens he bought an airplane ride for five dollars and from that day on dreamed only of becoming a pilot. Because of that dream the United States Marines gained a pilot who ran up an amazing fighter record and was awarded the Congressional Medal of Honor. Unlike another Marine, the boisterous Gregory "Pappy" Boyington, Joe knew how to handle public adulation. He

finished out his service, returned to his home state, and in 1955 became Governor of South Dakota.

"All the fun started for me," he said, "on October 13, 1942. I had been at Henderson Field for exactly four days, and in that time had been leading a full flight of Grumman Wildcats with the bars of a Marine captain on my collar tabs. Even the Wildcat was new, at least the one I was flying that day seemed new and strange, and I had to stop and think whether the throttle was pushed forward or pulled back to pile up the knots. I wondered about the pitch on the prop and whether my wheels were up or down.

"There were strange names too, Henderson Field and the goofy Guadalcanal, a place that had been only an unpronounceable name in the newspaper headlines. I still had to think how to spell Guadalcanal. I kept repeating my own name and reminding myself that I was in the Marines and was expected to do something about those Zeros up there. I could see them glistening as they tried to slither into the sun. There were three of them, but for the life of me I couldn't remember how many there were of us.

"I knew I was excited. I had been warned, time and time again, to keep my head, but none of the details of the advice would come to the surface. I knew there was danger of some sort, but now it was here smack in front of me. I couldn't put it into its proper place or remember the tactics I was supposed to use. I found myself cooking up a silly jingle:

Zero and me,
Down in the sea,
You really should flee!

"The Jap fighters jibed with all I had heard about them. Weeks of studying their outlines, structural characteristics and silhouettes had paid off. I recognized them at once. Their V-formation was sloppy, but I was to learn that this was all part of their strategy.

"There was a damp spot behind my knees and my hands were sticky. I tried to talk into my throat mike, but I can't remember that I made any sense, and I guess Bates, my sidekick, figured it was a new kind of static.

"It takes some time to tell all this, but it all blew up in my face in a few seconds. That's how it is every time you take on a few Zeros.

You're excited and your insides are in knots, and you catch the whiff of your own sweat. I'm not making this up. I was slack on that first fight and by rights I should have been bumped out of the play fast. Somehow, I drew my splinter of luck, and that's how it goes in a war. The Japs moved in, took up their attack position and their number one guy made a pass at me.

"As I said, I was very lucky. It all happens pretty fast, and no matter how you try to reconstruct it later on, there always are gaps in the picture. I remember that Nip coming down at me—and missing! I remember that part of it, but for the life of me I can't remember what evasive tactics I used to avoid him. All I know is that he missed and slammed on through. With that, I got mad and went after him.

"Now he made his mistake. He tried to outdive my F4F-4, the dope! I had him cold in a few seconds and punched the button.

"Sure, the Zeros are fast and the Japs can throw them around. You can't laugh those guys off. They know how to fly and they get the best out of what they have to play with. Don't laugh the Jap off as a fighter. He's very good and he has good equipment. I'm not making any comparisons, because as soon as you do that, you start telling things you shouldn't tell, and that's just what those babies want.

"Anyway, I went after that bird and let him have two short squirts. Maybe I used my sights, maybe I just hosed him down with everything in the cans. I do remember seeing him go fully out of control and I sat there trying to think just what it was I had hit to make him go skew-gee like that, but at the same time I pulled up and nearly cashed in my checks.

"That's where I made my second mistake. I was beaming with this victory, I guess. I don't know why I went back upstairs, but I did, brother . . . and did I go down again!

"The other two Japs had seen their number one man muff his chance and then they sat tight until the stage was set right for them. I was a big help, too. Instead of going down at *my* speed, I went back upstairs and tried to dogfight it with those Jappos. Dogfighting with a Zero is just like trying to take a nap in a concrete mixer.

"In a few seconds they had me where they wanted me and I was soon trying to sneak home through the treetops. I mean to say, that's

where Marine teamwork comes in. I guess my guys took a hand at that point, which is the only explanation I have for getting home. I did get home, but I was a sorry looking guy. The mechanics took one look at my Wildcat—they didn't say a word but I knew what they meant."

This young man who had destroyed twenty-six planes in the space of about ten weeks, knew his business and we liked him for it. He had started from a farm near Sioux Falls, South Dakota, went to Sioux Falls High School, and graduated from the University of South Dakota in 1940. He did not tell us of all the hard work that entailed, but we knew there must have been tough times getting through high school and the university while carrying out his share of the work on the farm. Captain Foss's father had been killed in an automobile accident in 1933, which left his mother burdened with running the home and bringing up two sons.

His flying began when he and a cousin hoarded their savings and induced a barnstorming pilot to take them up and give them the works. The aircraft had been condemned officially, and on its next flight it broke up in mid-air and crashed.

"In spite of that fatality, I guess I always wanted to fly after that." Joe smiled and stared into space.

As far as we knew, Joe Foss was no better and no worse than the average student, but he knew that he had to have an education if he hoped to get anywhere in aviation. As he roamed the South Dakota prairie with a rifle cradled in his arm, he had plenty of time to think, and whether he realized it or not, he was honing all the qualities of the natural hunter. All he needed now was the opportunity and hair-trigger timing that came with his Marine instruction at Pensacola.

Pensacola gave him the final training, but it also was a stumbling block to Second Lieutenant Joe Foss. He was a full-fledged pilot by March 15, 1941, but was so good, he was kept on as an instructor. That was how it seemed to him at first, but the extra Stateside time made Joe a greater pilot and taught him how to handle men so that when he went out to the Southwest Pacific he was of great value to Major Leonard Davis, his new squadron commander.

A Marine squadron of that time consisted of sixteen aircraft, divided for operational purposes into two flights of eight machines

each. Major Davis led one, and Foss, boosted to captain, led the other. He explained this with, "You see, I was the leader and what success I had must be shared with the men who supported me. They flew behind and protected me. I got the first shot at everything and *should* be the leading man. I'd be pretty bad if I didn't."

"It's teamwork that counts and I really had it behind me. My boys were alive and alert. They were always hustling and I could always rely on them. We did all right, too, out there at Henderson. My flight downed seventy-two and we lost only one man in the ten weeks I was out there. We lost Lieutenant W. P. Marontate, a Seattle boy who had thirteen Nips to his credit. That is, he is missing and we can only hope he is a prisoner of war."

Marontate was one of Foss's "city slickers," a city boy who had been a dress and lingerie salesman before Pearl Harbor.

"It takes all kinds," Joe explained ruefully.

Following his first kill, Joe scored again the next day near Tulagi and the tension began to ease off. By November 7 he had destroyed sixteen enemy machines. The day before he had downed five, which as he explained, probably accounted for the dumb trick he tried the next time out.

"November 7 came along and I was still glowing to myself about those five Nips I had clipped. I had nailed two in the morning in less than ninety minutes. Then I went out in the afternoon and they fell like ducks. I really had a field day.

"On this afternoon, we were on an alert so I went off by myself and a short distance from Guadalcanal, I caught up with a multi-place job of some sort and I guess I got curious. I had never met one of these and for my curiosity got a sudden burst from a rear gunner, and what happened sounded like someone banging on my cockpit with a length of elephant iron.

"I moved fast. First I made a fake pass at that gunner, snapped my Wildcat over hard and went at him with a lot of deflection. I got the gunner and saw him sort of flop over. Then I risked going in and came up under the Jap and let him have it well under the belly.

"I really had him in his blind spot and the poor guy never knew what happened to him. He burst into flames, started to throw parts away, and I beat it. A few minutes later I caught up with another

of these rear turret babies and this time I played it safer. The gunner tried to hold me off at long range, but eventually I knocked him off and came up from behind, and let him have a nice long burst.

"While I was finishing off this one, a Zero tried to rush me out of the play. I suppose he was making out he was doing an escort show, but so far he'd done a pretty poor job. I remembered how easily I had knocked off five the day before and—well, I got greedy, I suppose.

"I was about to learn another grim lesson and this time I was to learn it the hard way. That Zero fooled around for some time and then finally started to edge off toward the north. I fell for it and went after him. I give him credit, he did stand once and tried to put up a fight, but I finally got him and shot him to bits. That was the third within half an hour.

"But my lesson was in the making. I had only just started to turn back when my engine began to splutter. I eased her along, mentally kicking myself all over the cockpit for not playing it safe. I should have pulled out after getting my first Jap, since I knew I had taken a lot of stuff from that rear gunner. Now I was paying for my carelessness.

"Anyway, I nursed her along as well as I could, but it was obvious I was getting mine this time. She seized up and I had to face the fact that I was going down in the water. I could see a few small islands nearby, that is, they looked nearby, but when you're all alone and your prop has stopped ticking over, you soon find things to worry about.

"For one thing, I did not consider myself a good swimmer. I had a life jacket and a parachute, but it wasn't that easy. I held her off as long as I could and then decided to do a wheels-up landing on the water—and hope.

"The landing came off all right. She hit nicely and skipped along some easy rollers and didn't go down too soon. I had plenty of time to get clear, but I was excited, and not thinking straight. I clean forgot to loosen the safety straps across my seat. I would have looked very funny if there had been anyone around to see me, because I sat there wondering why I couldn't get out. The Wildcat was sinking slowly, and I was going down with her. A few minutes before, I'd been sitting there, positive I knew all about this Japanese business.

"Finally, I came to and suddenly remembered the seat straps. By

then the cockpit was filling with water, but I got clear just in time and slipped over the side. The plane still had some buoyancy, so I stayed near her. The water was fairly warm and I could see an island some distance off, but it still looked too far for me to try swimming. I stayed there, bobbing around that partially sunken plane until it got dark. I was not sure of that island, but when it started to rain, I felt I ought to do something and decided to try swimming.

"It rained harder and harder, and you know how it can rain out there. I struck off for where I had last seen the island and then in the darkness I heard voices. Naturally, I first thought they were Japs, but I felt a sense of relief when I caught an unmistakable Australian voice.

" 'Oii there. Where are you?' the voice called.

"I could just discern the outline of a couple of native canoes and then the faint blink of a lantern. I knew no Jap could imitate an Aussie's accent. No one can. I called back, 'Over here! Over here!'

"The canoes turned from the hulk of the Wildcat and I was helped aboard. I was sure glad.

" 'Where were you going?' the Australian asked.

" 'Over to that island—over there.'

"He laughed. 'You're bloody lucky, you know. That place is a regular colony of crocodiles. You wouldn't 'ave had a leg to stand on.'

"Boy, was I glad to get to land! My rescuer was an Australian who operated a sawmill right there in the middle of the Southwest Pacific war. A little later we contacted Henderson Field and they sent out a boat to get me. In five days I was back in the air getting more Japs down. On November 12 I shot down three more and on the fifteenth nailed another. Then a little flier who got more Yanks than any Jap, put me out of control.

"You guessed it. Malaria. One bite from the wrong kind of mosquito and you're really in a flat spin. I went down fast and didn't return to action until two months later. I stayed long enough to get three more Japs on January 15 and then I was sent home for a spell. So here I am."

Foss was awarded the Congressional Medal of Honor to place before his Distinguished Flying Cross and swatch of campaign ribbons. A few stories were written about him at the time, but not too many, and like so many others he was soon forgotten until a decade

later when the voters of South Dakota gave him their highest political honor by electing him the Republican governor of their state, not once, but twice.

Unfortunately, not all our war heroes came back to stand up so resolutely under the glare of publicity and acclaim.

Major Gregory Boyington of VMF-214 Squadron, Marine Corps Aviation, also won the Congressional Medal of Honor for his exploits in the Pacific against the Japanese. He was credited with destroying twenty-eight enemy aircraft, six of which were accounted for while Boyington was a member of Chennault's Flying Tigers in China. Thus, "Pappy," as he was affectionately known, was the leading ace of the Marines.

To say that Boyington experienced a checkered career would be an understatement. In a recent book, authored by this colorful Marine, he proves, in somewhat earthy prose, to be the most unconventional American war hero, but from the sales of this volume, he would seem to be a very popular figure. Everyone appears to know Pappy Boyington, whereas only a few people outside South Dakota have any idea who Joe Foss is or what he has done.

On the cover of his book Boyington charges: "Show me a hero, and I'll show you a bum!" This is hardly what he says of Joe Foss on less explosive pages between the covers.

After his short service with the Flying Tigers, Boyington returned to the United States and learned that as a result of the vagaries of the new induction law, he was to be delivered to the U. S. Army Air Force as a second lieutenant. Being a Marine with some experience with Chennault's force, he naturally resented this transfer. He ignored the usual channels and contacted the top man of the Marines and was eventually sent out to the Pacific where, after many unavoidable delays, and decisions of superior officers who were most critical of Boyington's behavior—on the ground—he finally formed the 214 Squadron and began a new path to glory. Unquestionably, he and his men fought valiantly and ran up a memorable score.

Major Boyington and his wing man, Captain George M. Ashmun, were shot down on January 3, 1944. Two other pilots, Chatham and Matheson, reported that they had seen Boyington shoot down one plane before he himself went into the sea. This brought his score up

to twenty-six planes, tying Joe Foss's year-old record. Boyington had to parachute into St. George's Channel off Rabaul when his burning aircraft had but three hundred feet of altitude left. Four Japanese machines continued to fire on him for twenty minutes but failed to inflict a wound. He was however seriously burned.

Just before dark a Japanese submarine picked him up and took him prisoner. This crew treated him fairly well, but once he was landed at Rabaul he was given little medical treatment for about ten days. After six weeks Pappy was moved up to Truk where he saw the U.S. carrier strike of February 17. Once the Japanese realized whom they had captured, Boyington was beaten regularly, until he was rescued at the end of the war. On April 12, 1944, he was awarded the Congressional Medal of Honor—his first decoration. Later, when he explained that he had shot down two additional planes on January 3, he was awarded the Navy Cross.

As previously mentioned, postwar reflections have brought out a variety of opinions as to the actual value of the over-all program of Allied bombing of enemy targets. It is generally conceded now that had German oil refineries and the more important transportation lines been given the full treatment right from the start, the war might have ended many months sooner.

Not all military authorities have agreed with this assumption. Sir Arthur Harris, at the time head of the R.A.F.'s Bomber Command, points out in his book, *Bomber Offensive*, the many problems connected with the British plan of night bombing. The German Reich-minister of Armaments and War Production, General Albert Speer, stated later, after looking at the savage destruction of Hamburg, "We were of the opinion that a rapid repetition of this type of attack upon another six German towns, would inevitably cripple the will to sustain armament manufacture and the war production. It was I who first verbally reported to the Führer at that time, that a continuation of these attacks might bring about a rapid end to the war."

Sir Arthur pointed out that in concentrating on one particular class of target, it was necessary to consider the many factors that made such a scheme impractical. He was, of course, speaking from the British (night flying) point of view. The weather was one of the most important factors, since in this section of Europe it was such that

his forces were lucky if they could find *and destroy* two-thirds of any list of such targets, and the chance of having favorable conditions to attack the remaining third would be very remote. In the American (day flying) plan, the raid was "scrubbed" . . . not attempted, if the weather was unsuitable.

If the R.A.F. planners had drawn up a full list of synthetic oil complexes, ball-bearing plants, and pinpoints of important transportation lines, there would have been a good chance of locating one in some part of Germany where the weather was suitable for a precision attack, but the possibility of the right weather for each target would decrease as the number of remaining targets decreased. Furthermore, when the possible number of targets had been reduced to some half dozen, it would be urgently necessary to knock them out before the targets already attacked had been repaired. Under these circumstances, the R.A.F. planners could only hope to get an opportunity to attack the last few remaining targets by keeping the bomber force in a state of perpetual readiness to make the attacks the instant the weather seemed suitable. This meant that the bulk of the R.A.F. bomber force would be kept standing idle, thereby missing numberless opportunities to inflict damage elsewhere in the enemy areas.

Harris also remarked that when this list of possible targets had been reduced to four or five, the enemy would know exactly what the raiders were going to do next, and with only a very few targets to guard, he could have surrounded these with the most formidable defenses.

The British faced, also, the problem of long and short nights. In June they could attack only within the circumference of a circle that ran through Emden and Cologne. Therefore, if a rigid program of oil-transportation-ball-bearing targets had been undertaken, they might have found that after completing part of the project, the period of short nights had set in, which would give the Germans several months of respite, either to disperse their critical targets, or rebuild them and have the whole system in operation again.

Later on in 1944, a new system was devised, one in which the day bombing of the U.S. forces could be included. The synthetic oil plants were raided time after time, but by that time the Germans had a mobile force of repair workers that was moved into action immediately.

All these factors had to be considered in the strategic heavy bomber offensive that began in 1943. Also, the bomber aircraft, designed for the R.A.F. offensive against Germany, were not flown at the tremendous heights of the American Fortresses and Liberators; a point seldom brought out in air-war histories. Most British heavy bomber raids were made at 6000 to 11,000 feet where they were caught more often in heavy anti-aircraft fire; or the missions had to be planned to evade the flak concentrations. Enemy defensive measures usually happened faster and with more accuracy at these low altitudes, and bomb-aiming had to be immediate and accurate, for there was little time to make test or experimental runs when the target area was reached.

While the Americans used speed, great height, and, whenever possible, forces of day fighters as their defense—as well as the highly rated Norden bombsight—the British made the most of the darkness, cloud cover, skillful navigation, and a reliable Wimpey Mark XIV bombsight. They also developed two very elaborate target-finding systems which worked from fixed bases, and eventually made the R.A.F. Bomber Command almost independent of the weather.

In 1942 the night raids on Germany were carried out with the use and guidance of a special Pathfinder force. Skilled navigators flew in ahead of the main formation to mark the target area with colored flares and enabled the aircraft crews that followed to carry out their tasks with less trouble.

This system worked reasonably well through the early months of 1943 until the Germans anticipated the raids and set up false flare guidances, which were often bombed by mistake. The Pathfinder system was replaced to some extent by what was known as the Oboe range. This was developed out of the methods used by the R.A.F. to "bend" and interfere with the beams used as navigational aids by the German bombers. A raider could fly along a certain beam, calculating its position at all times by means of radar, and aim for some given point. A primitive version of Oboe had been worked out during the attacks on the *Scharnhorst* and *Gneisenau* when they were in Brest harbor.

As the system was gradually improved it depended on the re-radiation from the aircraft of other signals sent out to it. Two ground stations were used, one controlling the aircraft by signaling a system

of dots and dashes whenever it deviated from the required course. The aircraft's path was part of the circumference of a circle passing through a target, the center of the circle being the ground station itself. Meanwhile, a second ground station measured how far the aircraft had moved along this arc of the circle, and from these measurements the position and speed of the aircraft were calculated at the ground station—not in the aircraft—which gave the raiders an important advantage. When the aircraft was in the exact position from which the bombs should be dropped, a signal was sent and the bombs were released. The British system was practically automatic.

The chief drawback was that the bomber plane had to fly a steady course, with no deviation, for a considerable distance before it reached the target. During this time it was extremely vulnerable. The range of the system was limited by the height at which the aircraft could fly, because the Oboe transmissions followed a straight line, and due to the curvature of the earth, had to be received at an increasingly greater height above the ground, as the aircraft's distance from the ground station increased. Another drawback was that only a few aircraft of the raid formation could use the Oboe system in any one attack, for the two ground stations could control only one aircraft at a time and only a few in an hour's time.

Variations of the Oboe system were tried between 1940 and 1943. Then an entirely new device was brought out. It was known as the H2S system and was contained wholly within the aircraft, so it had an unlimited range and was not susceptible to the varied forms of radar or radio jamming. There was no limit to the number of aircraft that could carry and use this device at the same time.

H2S was a modification of the British equipment used for tracking and detecting submarines or other vessels at sea. As is generally known now, objects on the ground or on the surface of the sea return a distinctive radar echo to this instrument. The war against U-boats would have been almost impossible without this radar device, and when it was found that large buildings, such as hangars, steel plants, and built-up areas could be detected through unbroken cloud or in total darkness, its possibilities were enhanced.

An electronics expert, Air Commodore D. C. T. Bennett, was put in charge of new experiments that resulted in the finding that the

system could be used to map-read, and later applied to bomb-aiming requirements.

In July 1942 Don Bennett had discarded the klystron valve (tube) and replaced it with Sir Henry Tizard's magnetron valve, one of the most rewarding inventions of British science that became indispensable for many forms of airborne radar. The only fear was that if a great number were used in subsequent raids, examples of these magnetron valves might fall into the hands of the enemy. By the end of that year, however, two squadrons of bombers were equipped with this system and the sets were fitted with a detonator that would blow up the secret device, should the aircraft crash.

At the end of the war the British were still using variations of all three systems, the Pathfinder, Oboe, and H2S.

The real Allied bomber offensive began during March 1943 with a joint Anglo-American assault against Germany's war industry. The idea of trying to break Nazi morale had been dropped, and both forces aimed for the general disorganization of all German industry, giving priority to certain aspects, such as U-boat building, aircraft production, transportation, and any German industrial city of one hundred thousand or more inhabitants. The Ruhr was still the principal objective since it was the most important industrial area in all of Germany.

Whether this plan was right, may still be a question. Air Marshal Harris had his doubts until well into the closing weeks of the Nazi war. Second guessers who have supported the oil-plant-communications target theory, have since been able to present a determined argument.

In those early days of 1943 the Allies carried on as best they knew, believing that several vital industries were important to the enemy. The British were convinced that saturation bombing of population centers had a profound psychological effect on the civilians. We believed that to keep pounding at the U-boat pens at Lorient and Saint-Nazaire would eventually win the Battle of the Atlantic. Our planners and economic warfare experts assured us that power dams, dockyards, ball-bearing plants, and engineering layouts were worthy targets, and bomber commanders made their plans accordingly.

The author has been told by present-day authorities who should know, that our prime targets in a possible World War III will be:

1) enemy atomic energy plants and nuclear weapons bases, and 2) large centers of population, which should have a deep psychological effect on satellite countries inside the Iron Curtain. It was pointed out that if large numbers of Soviet people can be disposed of, it will reflect on the importance of the Communist political ideology. If Russia's enemies can wipe out great numbers of Communists, the satellite peoples will realize that this fantastic ideology is not an assurance of world domination or even a national omnipotence. This is one factor the Soviet government cannot afford to risk, and it might be the chief deterrent to any future global conflict.

During the red-letter month of March 1943, Allied bomber commanders decided that the Renault auto plant in the Billancourt section of Paris should be given attention. At the time the managers were forced to turn out about a thousand trucks, tanks, and armored cars a month. It was the largest automobile plant in France and these figures are probably modest.

On the night of March 3-4, 1942, the R.A.F. had worked the plant over and caused much damage, but by using forced French labor and French money, the Germans rebuilt the shops completely within nine months, and with typical German efficiency increased the production rate to fifteen hundred trucks and tanks a month—or actually 10 per cent of the whole Nazi output.

Shortly after noon of April 4, 1943, eighty-five Fortresses appeared over Dieppe and from an altitude of 25,000 feet the mottled patch of Paris could be discerned, huddled in the coils of the Seine some ninety-five miles to the south. Spitfire squadrons flashed through the cobalt blue of the sky, some faintly visible, and some dragging contrails. All in all, it turned out to be an uneventful patrol. Three diversion units had flushed up Nazi fighters and enticed them out over the North Sea, so that by the time the Forts were over their target, there was little opposition to hinder their runs. They were over Paris at 2:12 without having noticed an enemy fighter. When the Spitters reached the end of their operational range, they withdrew, and the bomber boys hardly missed them.

There was very little flak and what came up was inaccurate. Every crew member was enjoying this unusual view of the French city of which they had heard so much. They gaped down at the Eiffel Tower, Notre Dame, and Sacré-Coeur, and the Bois from their guns

positions some five miles above. The more learned recognized the Left Bank, Montmartre, and the Champs-Élysées and reminisced mentally on student-travel days. One pilot who had done a stint of newspaper work in Paris before the war, was certain he could recognize the street on which he had lived.

By 2:14, the wedge-shaped concentration of shops and sheds that was Renault, filling a loop of the river, moved into full view. Several minutes later 251 tons of high explosive had been accurately delivered and the entire section was blotted out by a blanket of inky smoke. On the return run northwest to the French coast, German fighters made up for their previous mistake. They roared at the Forts time and time again all the way to Rouen where the support of friendly fighters was picked up.

Four Flying Fortresses were lost. American air gunners claimed to have destroyed forty-seven fighters, of which possibly half were actually shot down. As in all such cases, during the excitement it is difficult to know who damaged what, or who shot down whom. It is a factor that will always provide service arguments, and at the same time distill determined efforts to prove over the next few raids that such destruction of the enemy can be accomplished.

Aerial photographs, carefully studied and assessed, showed heavy destruction at the Renault works; hardly a building escaped serious damage—an excellent example of precision bombing.

Through March and April of 1943 the men and bombers that had been promised at the Casablanca meeting were arriving in the United Kingdom. They were a mere trickle at first, but within a few months became a flood tide. They had to be established, indoctrinated, and taught the tricks and rules. While it patiently waited for these recruits and new equipment, the VIII Bomber Command continued its persistent task.

These American successes pointed up the potentialities of precision bombing, and aroused the Germans to new defensive furies. Realizing that few important targets were out of range of these daylight marauders, Hitler increased his flak and fighter defenses, and new concentrations of both were set up around all vulnerable areas.

Bremen, an area of shipbuilding yards, diesel engine factories, and storage installations, was one of the centers of this new defensive network, but it also had another appeal as a target. A large airfield and

one of the Focke-Wulf assembly plants was on the outskirts of the city. Most of the F-W 190 fighters were produced here, and American Intelligence decided that this was a target well worth attention.

In the middle of the morning of April 17, 115 Fortresses were sent to Bremen to level this factory. Eight of them had to abort for various reasons, so 107 bombers reached the target. Shortly after leaving the English coastline, the rendezvousing formations were sighted by a German reconnaissance plane, and defenses were quickly alerted. There is always the problem of guessing just where such a loose formation will attack, but in this instance the Germans guessed correctly, and they put every available fighter in the Bremen area. The American bombers received a most vicious and concentrated series of fighter attacks.

The factory was severely hit, as later reconnaissance proved. The damage was so extensive that most of the buildings were left unrepaired for months, and production was halted for a long while; a loss of productive capacity that was felt acutely at a time when German aircraft industry was concentrating on fighters.

But a price was exacted for this hour of glory. Sixteen Fortresses were lost in the most expensive attack to date, although returning crews brought back heartening reports of seeing many parachutes. By comparing notes, the interrogators believed that a total of seventy-five open parachutes were seen during the attack, or during the two hours the enemy fighters were in conflict with the bombers. Some of these, of course, were Nazi pilots, for according to the claims of the Fort crews, sixty-three single-seaters were shot down. At the time it was thought that at least 50 per cent of the crews lost, survived, but this figure was never substantiated.

The toll paid for daylight precision bombing was brought up again in many quarters. Although the Focke-Wulf plant had been badly damaged, the raid showed in high relief the dangers peculiar to the plan. This was a well-designed and ably executed attack, but the problem of profit versus loss was a prime consideration. If the Germans were to concentrate such heavy fighter forces in these vital theaters, there would have to be tactical changes made in the program of action.

One of the most important phases of this planning was found where half a dozen stations, accommodating newly arrived groups,

were flying practice missions and familiarizing themselves with the navigational problems and the operational techniques of the European Theater, while at the Combat Crew Replacement Center more Fortress teams were learning the latest points of bomber defense from the veterans of our early ventures over the Continent.

Three raids were carried out early in May against targets in occupied territory. One, an assault on the U-boat pens at Saint-Nazaire, was the first air-war experience for Sergeant Maynard Smith, a ball-turret gunner. When his Fort was hit by flak shortly after it made its bomb run, Smith had to hand-crank his turret in order to raise it up into the body of the fuselage. Once at that level, he discovered that the flak burst had wounded the rear gunner and a 20-mm shell had started a fire in the radio compartment. The intense heat soon forced both waist gunners and the radio operator to bail out.

Smith gave the rear gunner first aid, and jettisoned the oxygen bottles and the ammunition in the radio compartment. He next fought the fire and manned the waist guns against a formation of F-W 190s. When the pilot finally brought the aircraft down on a British field, Sergeant Smith had everything under control. He was awarded the Congressional Medal of Honor for that afternoon's work.

Another Congressional Medal of Honor went to Second Lieutenant Joseph R. Sarnoski of Simpson, Pennsylvania. On June 16, 1943, Sarnoski, who was serving in the Buka area of the Solomons in the South Pacific, volunteered to go as a bombardier on an important mission to photograph and map a certain area. When the mission was nearly completed about twenty Japanese fighters intercepted. Sarnoski took over a nose gun and fought off the first wave of attackers, thus making it possible for the pilot to finish his run over the plotted course. When a co-ordinated frontal attack damaged the bomber extensively and wounded five members of the crew, Sarnoski, although wounded himself, continued firing and shot down two Jap planes. A 20-mm shell burst in the nose, knocked him down and sprawled him out along the catwalk under the cockpit. He crawled back to his post and continued to fire on the attackers until he collapsed and died over his guns. By the resolute defense of his aircraft, for which he paid with his life, Lieutenant Sarnoski made possible the completion of a vital mission.

This decoration was also awarded to no less than five American airmen who took part in the raid on the Ploesti oil refineries in August 1943. Regardless of the eventual result of this harrowing mission, it was no doubt the most spectacular attack made by an American force in the European operations. In cold figures, two groups of B-24 Liberators from the U. S. Ninth Air Force and three groups from the Eighth Air Force, operating from bases in North Africa, attacked the Rumanian oil fields at Ploesti and lost 54 out of the 177 aircraft engaged in the strike. Shortly afterward 60 of a group of 376 bombers were shot down in a single day during missions to Schweinfurt and Regensburg. These were shuttle missions in which the aircraft continued on to North Africa, after bombing their European targets. In a second attack on the ball-bearing plants at Schweinfurt on October 14, 60 Fortresses of 291 sent out were lost, which indicates the prohibitive rate of attrition some of these unescorted raids suffered.

The Ploesti raid may be considered one of proud sacrifice, or one of the worst failures of the air war. It depends on the point of view. In its simplest terms it was a daylight, low-level mission aimed at an enemy target that was well defended. Major General Lewis Hyde Brereton, Commander of the U. S. Ninth Air Force, was in charge of the operation. Whether General Brereton could be held responsible for the outcome, will long be argued. At best, it was hardly the traditional example of a well-planned mission.

Ploesti supplied the bulk of the Axis' gasoline and lubricating oil. If it had been cleanly destroyed, the damage would have been irreparable, and, equally important, the Eastern Front might have been eliminated in one stroke. Instead, more than four hundred American fliers were lost in a man-made vortex of flame and smoke. Of the 166 aircraft that reached the target, more than 50 were lost. Nazi prison camps gobbled up two hundred American POWs. Ploesti was not knocked out, only inconvenienced for a short period of time.

This was the second shot at the famed oil fields—the first had been made by a small force in July 1942 which alerted the defenses for what was likely to follow. Brereton's attack began sadly as one Liberator burst into flames and crashed on take-off killing all ten members of the crew. One by one, others aborted for various reasons until the force was reduced by eleven, seven of which pulled out of

Colonel John R. "Killer" Kane's 98th Group. Two hours after leaving North Africa the lead Lib which carried the group's chief navigator, Captain Anderson, suddenly spun down and crashed into the sea.

This incident caused considerable trouble for it was some time before another first-class navigator could take over. Eventually, the bomber, in which Colonel Keith K. Compton was flying, assumed the role with Compton and General Uzal G. Ent, chief of the Ninth Air Force Bomber Command, taking over, since a young and inexperienced second lieutenant was the navigator in their aircraft.

By 12:20 the Liberator force was crossing Albania and nearing Yugoslavia when unpredicted clouds added to their difficulties, and over the next two hours the carefully planned tight formations were broken up and whole elements lost from the arranged pattern. Three scattered groups circled the Danube in the vicinity of Bucharest in an attempt to form into some sort of order. Wrong turns were made, identification points were missed and general havoc prevailed.

The two leading groups, the 276th and the 93rd, reached Rumania on schedule and headed for the first check point, Pitesti, about sixty miles northwest of Ploesti, but behind them was the fearful muddle of aircraft all trying to regain their assigned positions while flying at almost zero altitude through most unfriendly territory. They swept through waves of machine-gun fire, and torrents of low-angle artillery that held them off like a steel drapery. They had to vault over wooded areas, hydroelectric lines, village church steeples, and factory chimneys. So far, there was scarcely any opposition from enemy fighters.

Between Pitesti and Ploesti was another check point, Targoviste, from where they were to turn south and east until they picked up a railroad track that would lead them back to the oil refinery area, and by this means each bombardier was expected to find his pinpoint and bomb his selected target.

When the two leading groups reached Targoviste, a major blunder was made. There were two railroads leading from the town and Compton and Ent selected the wrong one—a mistake easy to make from a fast, low-flying bomber. Their young navigator protested and pointed out the error, but he was quickly overruled. More than sixty bombers made this wrong turn and went roaring toward Bucharest and it was not until someone recognized the peculiar architecture of

that city, that the mistake was realized. By this time both the Rumanian and German staffs had been aroused and the Ploesti defenses were fully alerted; flak batteries went into action and every fighter squadron in the Balkans was sent aloft.

It was now hopeless to maintain radio silence and General Ent reported that there had been a mistake and explained that he was making a left turn to find the oil refineries. This brought all the aircraft up against the southern edge of the city which gave them a view of the target that was unfamiliar. In their weeks of poring over maps and sand-table models they had absorbed nothing that looked like this.

Meanwhile, the three remaining groups had reached Pitesti where the 389th broke to the left to make its attack, as briefed, against the Campina refineries some fifteen miles northwest of Ploesti.

More bewilderment set in when the bulk of the Liberator force appeared together over the Ploesti areas. The stage was now set for a major disaster. All elements of surprise had gone with the wind. Realizing that his bombardiers would never find their aiming points by going in from the south, Colonel Compton made a twenty-mile-wide sweep around the area, hoping to bring the refineries in from the right direction. Flak was unusually heavy, so General Ent went on the radio and directed the aircraft of his 376th Group to attack "targets of opportunity," and with that, the original plans for the bombing of Ploesti were completely abandoned.

Everyone was on his own. A few found their individual targets and struck straight and clean, others plowed into smoke clouds and, completely blinded, either crashed into other bombers or pounded with dreadful effect into chimneys and overhead pipelines. In one instance twelve bombers swept into a smoked-in target area, and only nine came out.

Frustrated by the unscheduled turns, or noting that their targets had already been plastered, squadron leaders released their bombs on anything that looked important. The defense fire torched bomber after bomber, and many floundered around, completely ablaze, looking for somewhere to drop their bombs before their crews were engulfed in their own holocaust. One Liberator that was trying to gain a few feet of altitude so that the crew could bail out, suddenly went into a series of fast somersaults, like a blazing pinwheel, and crashed

with every man aboard. Another bomber crashed into a women's prison and killed one hundred inmates.

Colonels Kane and Johnson, who had either kept their heads or were lucky, led their groups from the prearranged direction. As they went in they saw Compton's force flying below them in a south-westerly direction. They next noted that the targets that were to have been bombed by Kane's force, were already smoking or wrecked, so they were forced to fly directly into fires and explosions left by the others; delayed-action bombs dropped by previous visitors were erupting all over. Six aircraft were seen to be engulfed in these sudden explosions as the searing flame often reached three hundred feet, but the Libs had to plow on through. Those that survived had next to negotiate the fantastic turbulence caused by the heat, updrafts, and fire storms of the inferno. They were wafted about like sheets of paper in a breeze, or spun into the burning oil tanks completely out of control. Amid all this and the mortification of discovering that their targets had already been obliterated, there was nothing else to do but hit them again—there was no time, height, or space to set up a second run.

The 389th Group which had been given the Campina refinery was the least experienced of the whole force, but this was no joy ride. Although the flak was particularly heavy, Campina was accurately hit. A few aircraft from Colonel Compton's group that had been ordered to find targets of opportunity, dropped more bombs on the blackened installations.

The glory and tragedy of the Ploesti attack were over, but there were still some 1350 miles of return flight. By continuing to fly low most of the escaping bombers evaded the early attacks of enemy fighters; what few tried to pick them off, failed to pull out of their dive attacks and piled up in the open country. But if the Liberators evaded the fighters, the screaming curtain of flak and machine-gun fire slashed them to ribbons, and dozens of crew members were seriously wounded.

As the B-24s climbed higher to cross the Alps, Axis fighters of every type moved in. They were now able to attack in a more normal manner and some dropped fragmentation bombs on the raiders, which caused several Libs to lose their tails and spin in. There was no chance for the stragglers, those poor devils who had carried out

their bombing duties and then had failure in one or two engines; precious gallons of fuel were used in maneuvers to evade the defense fighters. A few aircraft managed to get back to Bengasi, some scrambled into Cyprus or Sicily, and others crash-landed in Turkey. One third of the total attacking force never returned.

Low-level oblique and high-level reconnaissance photographs were carefully examined by Middle East Intelligence Unit experts two days later. Several of these men had worked in the Ploesti refineries before the war and their interpretations cannot be ignored. Less than half of the through-put capacity of Ploesti had been destroyed, and most of this was repaired within a few months. General Brereton thought that 60 per cent destruction had been accomplished. Later it was learned that the important Romana Americana refinery had been missed completely, no serious damage was noted at the Standard Petrol and Unirea Sperantza plants, and only the boiler house at the Phoenix Orion plant appeared to have been damaged. Where targets had been cleanly hit, it was predicted that they could be restored in less than six months.

The Ploesti raid is generally considered the worst catastrophe in the history of the U. S. Army Air Force. The official figures stated that 177 aircraft had taken off, 11 of which aborted. Of the remaining 166, three crashed on take-off or en route and 54 others were lost in action. At the time a rumor persisted that the actual losses were higher, and some two years after, *Air Force* magazine published an article by Major Arthur Gordon in which it was stated that 42 bombers were shot down or crashed, and 31 others failed to return which would make the loss total 73, not 57.

Five Congressional Medals of Honor, the largest number ever awarded for a single military operation, were authorized for Colonel Leon W. Johnson, Colonel John R. Kane, Lieutenant Colonel Addison E. Baker, Major John L. Jerstad, and Lieutenant Lloyd H. Hughes, the last three posthumously. The Distinguished Service Cross was awarded to Major General Uzal G. Ent for his "tireless efforts, brilliant planning, and directing of the Ploesti mission." Colonel Kane also received the Legion of Merit, and Unit Citations were awarded down the line. Air Medals were given to all participants, and Kane promoted almost everyone in his group one grade. Most of these decorations were personally presented by General

Brereton in his last official act as Commander of the Ninth Air Force in the Middle East. It was an impressive ceremony, held on the polo field of the swank Gezira Sporting Club in Cairo and attended by representatives of the British and Egyptian forces.

It has been pointed out that the Ploesti raid of August 1, 1943, was not a thoughtless tactical mishap; the mission at least had some negative value. It offered the following minimum lessons that were considered in later bombing planning.

In the first place it was clear that low-level attacks by heavy bombers were much too costly, since unescorted heavy bombers could not adequately defend themselves against heavy fighter resistance. It was obvious, too, that military bombing was not as thorough as had been thought; that such a vulnerable, inflammable and concentrated target as Ploesti could vault back into operation within a short time. The Germans were resilient, resourceful, and unbelievably industrious in repairing bomb damage, and one, or even a few such raids, were not likely to knock out anything for very long.

It was well to consider these cautionary factors of the Ploesti mission, but Allied persistence solved a number of the problems. When Italy capitulated, the U. S. Fifteenth Air Force had a new jump-off spot from Italy's first-class airfields, and new long-range fighters to escort long-range bombers were in production or under development.

Regardless of the heavy toll, the U. S. Eighth Air Force continued to pound at enemy targets throughout the rest of the year. Two weeks after the ill-fated Ploesti attack, the deepest penetrations into enemy territory were attempted by the Forts based in England. Except for coverage over about two hundred miles, going out and returning, there was no fighter escort.

Regensburg, the chief base of the Messerschmitt factory operations, was raided by 147 B-17s commanded by General Curtis E. LeMay. Later that same morning 168 Fortresses roared out for the ball-bearing industry at Schweinfurt. Sixty bombers were lost in this combined operation, almost 20 per cent of the total force, and later evaluations indicated that the sacrifice did not justify the result. The Me 109s continued to move along the assembly lines with little interruption and what slowdown was experienced at Schweinfurt—

about 60 per cent of production—was amply covered by stocks on hand. Labor was quickly dispersed to other small plants, and at no time during the balance of the conflict, was German industry hindered by a ball-bearing shortage.

Nevertheless, dogged and determined Bomber Command officials sent out another Schweinfurt raid later that year. Again, there was no real fighter coverage, but the American concept of high-level daylight bombardment was continued. Sixty Flying Fortresses of a force of 291, were shot down with their ten-man crews. Six more crashed attempting to land in England. Much damage was inflicted on the German plants, but it did not completely justify the wholesale sacrifice.

The morale of the Eighth Air Force was very low, and the Germans were jubilant as their fighter pilots ran up fantastic scores. General Henry H. Arnold, Commanding General, later admitted: "No such savage air battles had been seen since the beginning of the war. Our losses were at an all-time high, but so were those of the Luftwaffe. Nevertheless, our bombers were not being turned back from their targets. We had the planes and the replacement crews, but whether we could maintain this loss-rate of 25 per cent was something I couldn't answer at the time. Fortunately, for all concerned, the weather took a hand, and from mid-October fog shielded southeast Germany for most of the remaining year."

The slaughter was brought under control by Mother Nature. Men and machines were limited to so-called milk runs—short, easy, fighter-escorted raids that provided experience and data for public relations agencies.

On October 24, Wiener Neustadt was raided by B-17s and B-24s of the Twelfth Air Force, working out of newly captured Italian bases. Turin's ball-bearing plants were raided on November 8 by bombers of the Fifteenth Air Force. An attack on Sofia by medium bombers of the Twelfth Air Force, marked the first assault on Bulgaria from that war theater.

Bremen was attacked on November 29 by 154 B-17s, and on December 13 an American record of 1613 tons of bombs rained down on Bremen, Kiel, and Hamburg from more than 600 bombers of the Eighth Air Force. Eleven days later German installations along the French coast were attacked by 650 heavy bombers that had suffi-

cient fighter escort. This was a record number of aircraft dispatched by the Eighth Air Force to date. They closed out their year by dropping 1393 tons of bombs through an overcast on Ludwigshafen.

Ploesti, the number one priority target, still stood. It was obvious that it would have to be destroyed, if the German war machine was to be halted. But how?

In the Southwest Pacific the turn of events was showing a more optimistic record. A blow of historic proportions was struck at Rabaul on November 4 when a powerful Japanese force, consisting of seven heavy cruisers, one light cruiser, and four destroyers, under command of Vice-Admiral Takeo Kurita, was en route from Truk to join two heavy cruisers, two light cruisers and four destroyers already at Rabaul. Kurita's mission was to wreck an American landing force and sink U.S. ships off Cape Torokina.

The only solution was to stop the Jap armada in daylight, which indicated a carrier attack on Rabaul—a mission that was somewhat premature in the plans of the U. S. forces in that region. However, Admiral Frederick C. Sherman was able to fly ninety-seven planes from the *Saratoga* and *Princeton*. These were joined by a land-based (Barakoma) combat patrol of Navy fighters, that sat over the carriers; the first such co-ordinated effort in the South Pacific.

The carrier pilots defied foul weather and heavy antiaircraft fire from the Japanese fleet and damaged four heavy cruisers, two light cruisers, and two destroyers. None were sunk, but twenty-five enemy planes were destroyed by the American naval airmen, who lost but ten.

Five carrier air groups went back to the Rabaul sector on November 11, but bad weather and a scarcity of shipping in Simpson Harbor cut the reward to one destroyer sunk, and a light cruiser and another destroyer badly damaged. Following this foray a number of Japanese planes followed the American aircraft back to their carriers and gave the Navy pilots based at Ondonga and Segi a field day. These flying sailors, aided by the carrier pilots and the antiaircraft crews, downed seventy-four Japanese fighters. Years later both sides revised these figures. The Japanese claimed seventy-seven American planes, while the U. S. Navy admitted a loss of only fourteen.

During all this naval activity seventy-five medium bombers of the

U. S. Fifth Air Force, that raided enemy shipping in Simpson Harbor, claimed to have sunk three destroyers, six merchant vessels, two freighters, and seriously damaged two heavy cruisers, two destroyers, seven merchant vessels, two tankers, and twenty enemy aircraft on the ground. At the same time they claimed to have destroyed sixty-seven enemy aircraft in the air.

A Congressional Medal of Honor was awarded to Major Raymond H. Wilkins of Portsmouth, Virginia, who led a squadron in an attack on the ships in Simpson Harbor. Intense antiaircraft fire was expected, and Major Wilkins arranged his squadron formation so that his aircraft would be in the position of the greatest risk. His squadron was the last of three in the group to enter the target area, and smoke from bombs dropped by preceding aircraft necessitated a last-minute revision of tactics to permit his element to strike at the vital shipping targets. This forced him to approach through concentrated fire and increased the danger to Major Wilkins' left-flank position.

His aircraft was hit almost immediately, the right wing was damaged, and control was difficult. He could, of course, have withdrawn, but he held fast and led his squadron into the attack. He strafed a group of small vessels in the harbor and then attacked an enemy destroyer at low level. His 1000-pound bomb struck squarely amidships and caused the vessel's magazine to explode. Antiaircraft fire from this destroyer had damaged his left vertical stabilizer, but he did not deviate from his course. He roared at a transport of about 9000 tons, and attacking from below masthead height, scored a hit which engulfed the ship in flames. Then a heavy cruiser barred his path, and in order to neutralize its guns and attract its fire, he went in for a gun-strafing run; his damaged stabilizer was shot away and he had to turn to avoid swerving into his wing planes. This move exposed the belly and wing surfaces of his aircraft. Enemy fire took up the target and crumpled Wilkins' left wing, and the bomber crashed into the sea.

Major Wilkins had destroyed two enemy vessels in this fierce engagement, and his heroic sacrifice made possible the safe withdrawal of the remaining airplanes in his squadron.

No record of the year 1943 would be complete without a reference to Colonel Neel E. Kearby of Wichita Falls, Texas, who was the idol of the Southwest Pacific, although he did not receive the acclaim

Stateside that was given to others who were awarded the Congressional Medal of Honor.

On October 11, 1943, Kearby had completed his tour of duty, but he volunteered to lead a flight of four Thunderbolt fighters to reconnoiter a strongly defended enemy base at Wewak, New Guinea. After he had observed enemy installations and reinforcements at four airfields and obtained important tactical information, he spotted a Jap fighter below him. He made a fast diving attack and shot it down in flames. His small formation then sighted a full dozen enemy bombers being escorted by thirty-six fighters.

There was no necessity to make an attack on this force since Colonel Kearby's reconnaissance mission had been completed, his fuel was running low, and his force was outnumbered twelve to one, but he gave the signal to engage. He plunged into the Jap formation, shot down three in quick succession, and then seeing one of his comrades being pursued by two fighters, Kearby skillfully destroyed them both. The enemy force was now breaking up into small attack elements, all designed to pick off the impudent raider, but Kearby made one more pass before he sought cover in the clouds. As he came into the clear he called his flight together and led them to a friendly base. He had destroyed six enemy aircraft after his primary mission had been accomplished. Colonel Kearby was reported missing in action on March 16, 1944.

During a routine raid on Emden, Germany, December 11, 1943, one of the epic fighter battles of the war was joined.

Although only one group of long-range P-51 Mustangs was operational, the fighter-escort problem was being solved gradually; most of the U.S. fighters detailed for these missions were equipped with variations of the auxiliary tank. Some tanks were carried out on the wing tips, others were slung beneath the fuselages, and with these improvisations the Thunderbolts and Lightnings were able to accompany the Forts and Libs to most of the medium-range targets inside Germany.

These auxiliary tanks not only provided extra fuel, they also added to the absurdity of wartime security. When correspondents noted these streamlined containers, they naturally asked how much extra fuel could be carried, and to what lengths the range of the fighters

had been extended. Not only were they not allowed to mention that U.S. fighter range was being increased, but whenever photographs were to be sent back for magazine reproduction, the wing tip or belly tanks were carefully air-brushed out. The same measures were applied to the water-injection systems being introduced in the Pratt & Whitney Double-Wasp engine to give short bursts of increased power in emergencies. All this secrecy was maintained regardless of the fact that many of these aircraft had already been shot down in enemy territory and unquestionably examined by experts.

But these temporary measures did improve the range of the single-seaters. The Emden raid was supported by about two hundred U.S. fighters, which included a squadron of Thunderbolts led by Lieutenant Colonel Francis S. Gabreski, one of the leading American aces of the period. His 61st Squadron was part of the 56th Group, headed by Colonel Hubert Zemke. This Group also produced Colonel David C. Schilling and Major Walker M. Mahurin, and this quartet of aces destroyed 105 enemy aircraft.

As the Thunderbolts left their base at Halesworth, England, shortly after 11 A.M. in inclement weather, it was not known that the skies over the target were clear. They climbed through layer after layer of murk, hoping to pick up the five hundred bombers at an appointed rendezvous over Western Germany. The P-47s came out into the clear at 22,000 feet and as they droned inland the sky above them became bright blue and at intervals small breaks appeared in the cloud layer below. The pilots went on oxygen, and Gabreski throttled back to an easy cruising speed of 250 mph. As they strained their eyes, searching for the B-17s and B-24s, boxes of bombers—twenty to thirty bombers to a box—appeared ahead, according to plan. Any hope that bad weather would keep enemy fighters grounded was now dispelled.

The bomber plan was to feint a false move by flying to a point northeast of Emden, after which they would make a sudden, sharp move, turn southwest and head straight for the target. The minute this turn was made Gabreski spotted a number of sharp-nosed Me-109s diving down at the bombers. With another quick glance he sighted about sixty twin-engined rocket-firing defense aircraft moving in behind the Forts and Liberators.

With the thought that the gunners in the bombers could hold off the 109s for a time, Gabreski gave his attention to the more dangerous

opposition, and as he turned to head off the rocket ships, two Thunderbolts collided directly over the leader's canopy. The crash was so solid that both planes exploded and neither pilot had a chance to get out. The 61st Squadron was now cut to fourteen aircraft.

The loss also made a flare signal for the Germans. For the first time they saw Gabreski's formation, and, for some reason, began breaking off in all directions. Gabreski ordered his squadron to move into flight elements and give chase.

Then ensued a swirling conflict that all airmen dread. There was no co-ordination or set plan; Messerschmitts and Thunderbolts roared in and out from all angles; rockets, tracers, and debris flew in all directions; individual duels swept into disorganized masses; vertical columns of smoke coiled up and dirty-white parachutes began to dot the sky. The fight seemed to go on endlessly.

Gabreski selected an Me 110 rocket carrier and methodically let the German take its place within his gun sight—he pressed the trigger and four wing guns tore the enemy fighter to wreckage. To make sure he had completed the job, he gave it another squirt and the 110 went into the death plunge.

There was a slight breather, and the glare of torn dural and the eruption of flame subsided. As Gabreski looked for possible stragglers he realized that he was quite alone; none of his squadron was to be seen anywhere, so he headed in the general direction of the bomber formations. Apparently the Me 109s had been held off, for the bomber boxes appeared to be in good formation and were still heading for Emden.

As he cruised south, Gabreski spotted a number of radial-engined fighters spread out some few thousand feet below, so he headed in their direction. Thankful that he had found some friendly company, he took time to check his instrument board—the fuel gauges warned him that he should head back for England. In the wild full-power maneuvers of the previous melee he had used up an enormous amount of gasoline. Concerned with this situation, he moved toward the formation of fighters below, and then suddenly saw that they were a pack of FW-190s, German fighters powered with radial engines not unlike those in the noses of Thunderbolts. Gabreski knew he was in no position to engage in further fighter tactics, so he made a sharp 180° turn, hoping that the enemy pilots would not spot him.

His luck held for a time and when a fleeting opportunity arose, he turned west and headed for home. In his move to get away from the FW-190s he had wisely climbed back to 27,000 feet. He next computed his position in terms of gallons, miles, and time. He remembered that he had jumped the rocket ships north of Emden and had made little progress southward after that. If his calculations were reasonably correct, he should be over or near the Dutch border. After crossing that part of Holland, he would have to fly the North Sea at its widest, a distance of more than one hundred miles, to touch down in England. Otherwise, it was a ditching, and ditching in the North Sea in December was no bargain unless he was picked up by Air-Sea Rescue within an hour.

So he set the throttle for a very lean mixture and hoped he could get in on the remaining seventy gallons. The Double-Wasp consumed a gallon or more a minute during an average combat mission. Seventy gallons, seventy minutes. Distance actually unknown.

As he made these computations, Gabreski noticed a single plane crossing his track from the three o'clock area. It was obvious that they would close at an angle of about seventy degrees. For a few minutes he was unable to identify the plane, but he realized that the newcomer was flying at high speed, while he was limited to a lean-mixture setting. By checking identification marks, second by second, he gradually saw that the machine was an Me 109.

The German came in fast, went into a turn and his guns began to sparkle. Since he was unable to use full power, Gabreski could only time his turns and hope to outmaneuver the enemy. At a slower speed he had something of an advantage, but the Me 109 had all the time in the world, and it continued to twist, turn, and make passes. Finally recognizing what sort of tactics Gabreski was having to use, the German came around carefully and took his time to set up a sitting-duck shot. Gabreski pulled up into a tight zoom, but the enemy guns scored this time. There were three distinct crashes, the cockpit filled with dust and smoke, and Gabby sensed a stinging pain in his foot. A 20-mm shell had exploded under his instrument panel, taking the heel from his shoe and the rudder pedal from the control system. He realized too that his engine had been hit, so he let the Thunderbolt fall off into a left-hand spiral.

At this minute he believed his flying career was over. He was low on

gas, he was losing valuable altitude fast, and he had no idea what damage had been done to his Double-Wasp. A cloud layer hung below and a few miles ahead. Behind him the Me 109 pilot was turning into a position for another attack. Gabby stayed with the awkward spiral to about 15,000 feet, hoping the German would think he was out of action, and then he made a sudden pull-out and headed for the clouds. With a final glance back he saw the 109 rushing at him, as the welcoming clouds enveloped the P-47. The blood drained from his head with the high-speed pull-out, but the nose of the heavy fighter gradually came up and he continued on, flying by instrument through the murk. The engine was running rough, but was still ticking over and Gabby eased her back into a climb from the 6000-foot level at which he had pulled out.

When he came out into the blue again, he looked back and saw the coast of Holland receding. If he still had fifty gallons in the tanks, he might make it. He might, but he took no chances and for the first time, called on a frequency reserved for such emergencies and explained his situation.

In a few seconds a radar operator in England located him on the screen and gave him a course to fly that would get him back to England in the shortest space of time. If he failed to cover that distance, Air-Sea Rescue would be but a short distance from where he might splash in.

Gabreski leaned out his mixture control until the engine ran rougher than ever. Mile after mile with the big twelve-foot propeller just ticking over but still pulling the heavy Thunderbolt across the North Sea, Gabby searched for his first view of Britain. As the engine ran rougher and rougher, the cylinder temperature increased and the next problem was how long the lubrication supply would last. The Thunderbolt was so low now he could not see very far ahead, but gradually the craggy coastline of Albion loomed through the low ocean mists.

His hope was holding, but his vitality was running low; the tension had been terrific, his body was drenched in sweat, every muscle ached, and each physical effort was torture. When at last the long black runway of Halesworth lay before him, he could scarcely raise the energy to lower the wheels, adjust the flaps and ease back the stick for a thudding landing. His engine was a complete write-off.

But Field Order Number 198 had been carried out. The enemy attack on the bombers had been met and broken up. More than five hundred bombers had hit Emden successfully; seventeen of them with 170 men aboard were lost, but the percentages were getting better, thanks to fighter pilots such as Colonel Francis S. Gabreski.

CHAPTER VI *In the Great Tradition*

[1944]

THE YEAR 1944 brought an end to the stalemate in *Festung Europa* when Operation Overlord, the long-awaited invasion of Hitler's continental fortress, became a reality. The plans for this gigantic military campaign, which had been devised, revised, and eventually completed by the Allied leaders, were implemented in the early summer of this eventful year.

Nineteen hundred and forty-four also saw some waning in importance of the airplane, and its replacement by the armored tank. The world's focus was on the movements of infantry divisions, armored forces, and war maps that showed the advances of men and machines, rather than the symbols indicating where last night's air raid was made and against what type of target.

It is true that much of the battle in Italy was a bitter, frustrating engagement that was fought by men and armored machines all the way up the Wellington boot, but its chief military importance lay in its strategic goal to defeat the Luftwaffe. The victory before Cassino and along the road to Rome afforded airfields from which Allied airmen could raid Rumanian oil fields and distant targets in Germany and the Axis satellites. As costly as the Italian invasion may have been, the footsloggers also held down twice as many German divisions as they themselves had committed to the campaign, and thus gave invaluable aid to the Russians—the Germans on the Soviet front were in dire need of reinforcement.

On January 21, 1944, General Dwight D. Eisenhower was called back from the North African Theater of Operations for his first

meeting with the Allied planning staff in England, and early the next month he took formal command at Supreme Headquarters. More than one million U.S. troops had arrived in the United Kingdom and the invasion supply stockpile had risen to 2,500,000 tons. More than one thousand troop-concentration camps had been set up, and one hundred marshaling areas made ready for the operation. Some 144,000 tons of supplies were pre-loaded, awaiting the signal for D day. The Allied naval forces had gathered 4100 ships and landing craft, including major units of both the British and American fleets.

The Allied air forces, under the command of Air Chief Marshal Sir Trafford Leigh-Mallory, were given a most complex role, both offensive and defensive in character. They were to protect the convoy during its approach to Normandy and throughout the battle for the beaches. Offensively, they had the mission of aiding the operation by delivering airborne troops, by bombardment of enemy defenses, and by attacks on enemy lines of reinforcement and supply. Tactical aviation had once again come into its own.

The mutual confidence of ground and air commanders brought the full blossoming of tactical air power, but it is difficult in wartime to depict for the general public the full extent and value of tactical operations. Full-force air raids against recognized targets are simple to headline. The exploits of the air aces, because they are presented as the performance of an individual, can be understood and appreciated by the news reader, but the bombing of a bridge, if it is offered as the act of a determined air crew, can be expressed only in the general terms of a team accomplishment. The destruction of a marshaling yard or railhead has an effect that is appreciated only after weeks of military operations. Thus, it is difficult for the military reporter to make his reader fully appreciate the over-all results of tactical air operations. It was months after Generals Patton and Montgomery had broken out of the Normandy bridgehead that the public became aware of the magnitude of tactical air's destruction, and by that time the story was outdated.

In a strict sense, the Normandy invasion began with air operations long before D day. From the summer of 1943 to the following spring, the U. S. Eighth Air Force concentrated its attacks on German aircraft industries and airfields with the primary purpose of preventing the enemy from improving his strength in the air. It is believed that

the German Air Force lost between five and six thousand aircraft during this period, and was never able to enlarge its first-line force in preparation for the expected invasion.

Continued attacks were made on Germany during April and May 1944, with the idea of forcing Goering to concentrate his air strength in the home area. The heavy bombers entered on a phase of operations directly related to the impending assault; a series of strong raids on marshaling yards and airfields in France, the Low Countries, and western Germany, over an area large enough to preclude any indication of the precise invasion sector. The attacks on marshaling yards were planned to paralyze repair and maintenance facilities, thus wearing down the capacity of the railroads and forcing the military to use the roads. During May the range of air attacks was gradually narrowed and reached a climax in the three days preceding D day. However, even in this period of final blows against rail junctions and airfields, a majority of the targets were along the Channel coast east of the Seine.

Our Ninth Air Force medium bombers and fighter bombers also shared in the preparatory phases of the assault. During April, and with increased intensity through May, they raided enemy airfields in northern France with the aim of neutralizing all strips within one hundred and thirty miles of the assault beaches. From Brittany to Holland, thirty-six airfields received one or more attacks during May. Marshaling yards were also the targets of the medium bombers from March 1 to June 5 when thirty-four yards in Belgium and northern France were hit in a total of 139 raids. In most cases the results were excellent. The important yard at Creil, north of Paris, was 60 per cent out of commission as the result of a raid on May 24. Later that same month the rail bridges on the Seine and Meuse Rivers were given increased attention. By June 4 all ten rail bridges between Rouen and Conflans, and all but one of the fourteen road bridges, were knocked out. Fighter-bomber attacks on enemy rolling stock during May inflicted considerable damage, and on the twenty-first of the month five hundred aircraft had rewarding results when they destroyed fifty locomotives and seriously damaged thirty-two. At the same time thirty complete trains were bombed and shot up, which must have played havoc with the German defense mobilization plans.

Bomber Command of the Royal Air Force switched the main

effort of its attacks during May from Germany to France and the Low Countries; of 37,250 tons of bombs dropped, 28,703 were directed at targets which were chosen as part of the softening-up process leading to the invasion.

The locomotive-busting fliers gave the war correspondents a completely new set of characters and scene of action. For the first time I met a group of wartime airmen who, in comparison to the punctilious bomber crews, seemed to have leaped straight from the movie air epics of *Lilac Time*, *Hell's Angels*, and *Dawn Patrol*. They flew P-38s which were rigged up as fighter bombers, but on the day I arrived at one of these "loco" airfields, everyone was playing softball. It was a beautiful day and they should have been in the air preparing the way for the invasion. Instead, they were all grounded because they had been so busy, so intent on smashing locomotives, they had burned out every available aircraft on their field. They were commanded by Colonel Cy Wilson who had destroyed eleven locomotives on his last two missions. "There's nothing to it," he explained between innings.

In this softball game the headquarters group was playing one of the squadrons. A major umpired, and Colonel Wilson was stripped to the waist but had a GI cap perched on his head. His deputy leader covered second base dressed in a pair of ragged khaki shorts and a very swank garrison cap. The Operations officer, who had borrowed a pair of KP dungarees and a repulsive sweat shirt, cavorted about in a pair of knee-high flying boots. First looies had vitriolic arguments with lieutenant colonels; GIs took the major to task for certain decisions; a corporal who was coaching at first questioned the ancestry of a captain. The bars were down, the rank was off, and it was every man for himself.

This particular gathering was the leading loco group in the Ninth Air Force. They specialized in this particular form of insanity, and between February 1 and July 15, 1944, they had riddled and exploded 197 valuable engines. This total does not include eighty-one simply registered as "damaged." In their "destroyed" list they sheepishly mentioned 10 barges, 50 oil cars, 157 flat cars, 10 flak towers, 209 transportation trucks, 43 gasoline and ammunition dumps and innumerable personnel.

After the ball game I was shown around the wrecks of the aircraft and learned that their public relations officer was Dexter Freeman, who before the war had made a living writing murder mysteries. Needless to state, he was in his element.

Colonel Harold J. Rau, who headed the group, was away on leave of absence in the United States and had left Cy Wilson of Westpoint, Texas, in charge. Wilson had joined the group late in March 1944, and in two months had racked up fifty-four consecutive missions—leading the formation each time. The group medical officer finally caught up with Cy and grounded him.

As an alleviating recreation, Cy liberated a motorcycle—stolen from an MP—and rode through the GI billet lines, screaming his challenge, like an old-time Highlander. But one should not get the impression that this was a ragtime organization; when the mission orders were up and blouses were being worn, you could get a salute that sizzled. It was just that the commander of the group, Colonel Harold Rau, had been a buck private in the same outfit. Reflections like that can produce many amusing situations, but a group that had destroyed as many locomotives as this crew, was entitled to certain interservice leniencies. Locomotives were what mattered. Some concentrated on bridges, others aimed to shoot down every enemy fighter in the skies. Others had a hate on Berlin or Schweinfurt. This outfit was simply loco on locomotives.

Lieutenant Joseph S. Ford of Linden, Alabama, had joined this truculent mob but a short time before and probably felt somewhat out of place amid all the Distinguished Flying Crosses and Silver Stars. He decided that there was nothing to do but cut himself a piece of the same cake.

On his first mission he joined up with Lieutenant Chester Hallberg and Lieutenant Edgar Malchow, who, once they were over enemy territory, were severely hit by enemy flak, and Ford, the neophyte, was ordered to take them back. Since Joe had two very efficient engines and his pals were nursing a couple of crocks, it was necessary for him to do a lot of S-turning to stay with them. This used up a great deal of fuel and Joe had to figure his tankage closely to know how far he could go with his escort task.

All went fairly well until they reached the French coast where two F-W 190s arrived to split up the party. Since Malchow and

Hallberg were in no condition to do any fighting, it was all up to Ford. Sensing they had two lame ducks, the German pilots decided to do up this job neat and tidy. First, they dropped their belly tanks to have more maneuverability. Joe did the same, and wasting no more time went into action. This resulted in such a wild display of war flying that one of the F-Ws broke up in mid-air without a shot being fired. The other made an impotent pass at one of the crippled P-38s and, as the saying goes, his day's work was done; Joe Ford took him apart, piece by piece, until the whole tangled mess disappeared into a cloud bank.

Meanwhile Malchow had taken another hunk of flak in his one good engine and it spluttered and filled his cockpit with smoke. Noting the trouble, Ford skidded up close and with cheerful innocence suggested that Malchow try the other engine again. It was a sophomoric idea, but it worked! The starboard engine picked up just as the port one conked out.

The flak was now so well clustered that the radio sets of the two damaged aircraft were cut out, and Ford had to continue his aerial sheepdog work by visual contact. As they crossed the Channel the weather turned sour and Joe's problem worsened, but near the English coast he radioed in and received new course instructions and led Malchow and Hallberg to an emergency field. Their P-38s were so badly shot up, they were never flown again, but Joe Ford was soon marching around with the gay ribbon of the D.F.C. on his blouse.

One of the most interesting of this Ninth Air Force crew was Major Jack Ilfrey of Houston, Texas. When I first met him he had eighty-five missions in his logbook and had downed eight enemy aircraft. He was a veteran of the North Africa campaign.

One day Jack came back from a locomotive mission with about three feet of wing missing, which had been caused when he collided with an Me 109. How he got back to the base was a mystery, because even a P-38 isn't supposed to fly under such conditions.

Jack just grinned. "You ought to see the other guy. He went down wabbling and smoking."

The loco group ran up an impressive score against enemy transportation but seemed to get into extraordinary scrapes while carrying out these low-level flights. The destruction of railroad material is an

art in itself and must be carried out according to a prearranged plan. But once the locomotives are left spurting smoke and steam, or trails of rolling stock are twisted over an embankment, almost anything can happen. The day before I arrived at this base a trio of P-38 pilots, Lieutenants Ernest C. Feibelkorn, Walter F. Keummerle, and Benjamin N. Rader, got into a hair-raising melee over the invasion coast. Rader was leading the element which had been strafing a convoy of trucks; one member of the main flight had been forced down near the target and Rader, Feibelkorn, and Keummerle headed back home somewhat the worse for wear. As they approached the French coast Keummerle knew he couldn't make the Channel because one engine was completely dud and the other was losing all interest in the war.

"I was about four miles inside our invasion line," Keummerle told me, "and I decided to bring her in for a belly landing. I held my breath, trying to imagine what would happen if I hit a land mine.

"Instead, I skidded right into the middle of a British infantry division. It was a hot spot too, and I was plenty scared. Shells, bombs, and small arms were going off all over the place. I spent the night in a tent near a foxhole and the following day I caught an air ambulance plane back to England."

Feibelkorn turned back when he heard Keummerle explaining that he was in trouble. "I scouted around and tried to find him," he reported, "but he was nowhere in sight. By that time I was running low on gas, so I decided to land too. I came in on one of the newly built air strips near the beach and almost lost my lunch when I discovered I still had a 1000-pound bomb hooked to my rack. A British regiment took good care of me, but it wasn't much fun crouching in a slit trench all night while the Germans bombed and strafed the strip. The next day I got passage back to England on a subchaser."

Rader was well out over the Channel before he gave up hope of getting back to England. His story went like this: "My port engine was as dead as a mackerel and I knew there was danger of the other conking out. Most of the electrical system was shot out, so I turned back for our strip of French coast.

"A few miles off shore I bailed out, after making sure I was near some boats. My life raft had blown away and I had to depend on

my Mae West and a rubber cushion to keep afloat. I shivered there in the drink for about fifteen minutes before a British frigate picked me up. I was later transferred to a destroyer, given warm clothing and food and taken back to England."

Every pilot in this loco group had an unusual story. On a return from Frankfurt, Lieutenant William K. Coon was still dissatisfied with his bag of locomotives, so he went looking for more trouble. He found a ship steaming across the IJsselmeer, and put the P-38 into a sharp dive and raked the German vessel from stem to stern with machine-gun and cannon fire. A cannon shell sent the flag mast toppling, and for some minutes the enemy flag was draped over his wing tip. Since that day Bill Coon claimed to be the only Yank who had flown on active service *under the German flag!*

But it was not all fun and games. Once in a while one of them was properly clobbered. Coming back from over Holland where he had shot an Me 210 to junk, Lieutenant Jack Martin was suddenly jumped by two Me 109s. Jack was tired—it had been a long, hard day, and the Jerries came in from the sun. The first Me 109 burst cut a deep gash in Martin's head and a piece of 20-mm shell pierced his skull and must have lodged near his brain. He was dizzy and half-blinded, but he fought his crippled P-38 through the concerted attack. His radio went out and the enemy slugs battered his plane from nose to rudder.

"I never prayed so hard in my life," he said. "Blood was streaming down my face and shoulder. I felt terribly weak and could hardly see at all. I had to close one eye to read what instruments I had left.

"I lost contact with my flight and headed home alone as fast as I could go. That was one time I really sweated out the English coast. Once, I thought the game was up when my best engine began to splutter, but it soon evened off again.

"I reached an emergency landing field and brought my plane down and found an ambulance waiting for me. How they knew of my plight, I never found out."

A delicate surgical operation removed the piece of steel from Martin's skull, but he still had fragments in his neck and shoulder. When I last saw him he was awaiting a new fighter and champing to get back over the Channel.

When Lieutenant Lee W. Anderson went locomotive hunting one

day, he was having one of his anxious periods. He saw one and went down after it, but was so intent on making a good job of it, he almost finished himself. He went in so close that as he came out, he found he had left part of a propeller blade and a long section of fuselage on the engine.

"They build those French trains too damned high," he complained when he got back.

Although Germany was first on the U.S. priority list and the stage was being set for the greatest military invasion in all history, remarkable progress was being made in the Pacific. In the year 1944 the U. S. Seventh Air Force shortened the distance between its forward bases and Tokyo from 3467 to 1267 nautical miles. The distance problems had dominated much of our strategy in the air war against Japan, and at one time a line drawn around the outposts of the Japanese defense system would have been equal in length to that of the equator. The Asiatic enemy counted on making the cost of each coral atoll in the Central Pacific so prohibitive that the U.S. would be forced to consume many years in bringing the Japanese home islands within range of strategic bombardment.

Japan's plan was to make Tarawa the pattern of our offensive. At Tarawa in the Gilberts group, the attacking U. S. Marines suffered high casualties, but with the acquisition of a network of bases from which tactical air units could operate, the succeeding strikes against the Marshalls and other islands were less costly.

Preparatory to the invasion of the Marshalls, land-based aircraft pounded the Japanese strong points for ninety days, during which time the Seventh's heavy bombers flew 1135 sorties. Our B-24s demolished the radar installations on Kwajalein so effectively that when the time came for our amphibious forces to strike, the U. S. Fleet made its approach undetected. The Navy's aircraft brought these attacks to a climax with a series of massive strikes.

In the Marshalls the Seventh Air Force undertook the destruction of aircraft and air facilities on Maleolap, Wotje, Roi, and Kwajalein. From a base at Makin our Mitchell (B-25) bombers flew regular missions against heavily fortified Maleolap—a total distance of 850 miles. In the early flights in that theater such distances made fighter escort impracticable, and after each such mission the enemy sent its

fighters against the B-25s and inflicted losses and serious damage. The fighters would follow our medium bombers a certain distance and then turn back, thinking they had gauged the range of the American fighters. A group of P-40s with auxiliary tanks finally prepared an ambush by waiting above the clouds at the point where the Japanese usually turned back. When the returning Mitchells were seen, hopping the waves and closely followed by a swarm of Nip fighters, the P-40s dived on them from 12,500 feet.

Within three minutes the backbone of Japanese fighter opposition in the Marshalls was broken.

When the islands of Kwajalein and Eniwetok were occupied by U.S. ground troops, it was possible to establish an aerial blockade of the bypassed atolls still held by the Japanese, and thus enable the ground troops to consolidate their positions and make further advances unmolested by enemy air action. Combined Army, Navy, and Marine Air Forces isolated 20,000 square miles of Japanese-dominated area in the Marshalls. By the time U.S. troops had invaded the Marianas, the Japanese bases, such as Nauru in the Gilberts, and Mille, Jaluit, Maleolap, Wotje, Rongelap, Aur, Arno, and Likip in the Marshalls were not considered worthy targets for any sustained attack. A continued harassment was carried on with fighters, dive bombers, and occasional medium bombers.

Truk, once the most heavily defended island in the Carolinas and the keystone of the entire Japanese defense system in the Central Pacific, was to a great extent neutralized by early 1944. It was dangerous to the extent that the Japs were willing to commit their dwindling fighter force against the sustained U.S. bombardment.

The mission of the Seventh Air Force fighters in the Marianas, besides the defense of the islands, included special raids against enemy airfields, gun positions, and communications. Some of the P-47s flew daylight shifts, and P-61 Black Widows, new in the Pacific, operated at night. Throughout the month of July, when Tinian was secured, Seventh Air Force fighters flew 3430 sorties with some pilots flying an average of two or three a day.

The picture of the complex war in the Pacific is best reflected in two typical combat incidents.

Lieutenant Marvin B. Watts who was flying a B-25, discourteously named *Ole Woman*, from Makin in a strike against Nauru, came

down from 7000 feet for the bomb run. His bombardier planted a clean hit on a dangerous gun emplacement, but during the run-in the flak was very heavy and both engines were knocked out of action. A shell also burst just outside the pilot's compartment and another tore through the bomb-bay door. The splinters hacked at some of the plane's controls and she started to fall. Lieutenant Watts fought to get the upper hand and managed to pull out of the dive and ease back into a glide which carried the aircraft about twenty miles out to sea. He leveled it off just before it hit the water.

The entire crew scrambled out of the escape hatches and clear of the sinking plane. The life raft broke loose and inflated automatically. The water was full of sharks that were attracted by the spreading blood of the injured men; the tail gunner had a broken leg, a severed artery, and hip and back injuries. Although cut and bleeding and in severe pain from a broken ankle and rib, the radio operator fought off sharks and towed the gunner to the raft. A rescue plane came over and sprayed the sharks with machine-gun fire, and eventually every man from *Ole Woman* was saved.

Chambermaid was a B-24 bomber assigned to a mission over Iwo Jima, and as her bombs were released above the designated target, flak hit the nose compartment and severed the hydraulic lines. A 20-mm shell from a Jap fighter exploded behind the co-pilot, wounding him. The throttle controls were shot away and the two starboard engines ran wild. A third engine sprayed oil all over the sky. Another shell blew off the top turret and wounded the gunner inside; a third one ripped a hole in the top of the left wing gas tank; the plastic turret cover flew off and tore a great hole in the rudder, and the navigator and an observer were wounded.

Lieutenant William V. Core, the pilot, had no choice but to turn for home and hope for the best. As they floundered on they flew into a tropical storm. After negotiating that with great difficulty, they came out of it and found their landing strip. With no hydraulic system they had to hand-crank the wheels down, but only one wheel responded to that effort. That left them with the nose wheel and one main leg, which might not have been too bad, but the same hydraulic system that should have lowered the wheels, failed to provide brake pressure, so the crew anchored two parachutes at the

waist windows and another at the tail to cut down their landing speed.

Chambermaid hit the runway on two wheels, but with all parachutes open, rolled along in a straight line for a few seconds and then swerved to the right, struck a parked trailer and bounced off into a revetment. When she finally came to rest she had dug her bomb-bay doors in hard, opened a gap in her fuselage and twisted her tail around at right angles. But *Chambermaid* had come back, and no lives were lost.

All missions were not that spectacular or lucky, but all routine attacks in the Central Pacific were hazardous. Weather conditions were uncertain and subject to unpredictable fluctuations. On one raid on Iwo Jima bombers from the Seventh Air Force flew into a snow-storm on the way out, and had their paint blistered by a blazing sun on the way back.

Weather hazards were also large factors that curtailed the efforts of the Eleventh Air Force based in Alaska and long the Aleutians. This force had compelled the Japanese to deploy their precious air strength in the area of the North Pacific. By mounting a series of harassment raids against the Kuriles, in the face of harsh Arctic conditions, the Eleventh had drawn a part of the Japanese Air Force to the defense of the Kuriles and Hokkaido. At the same time the U.S. had succeeded in establishing a chain of operational bases, which sealed off a vital sector in our continental defense system.

It takes all kinds of heroism to make up the history of a war.

Early in February 1944 American naval officials in the Pacific were completing plans for an attack on the Japanese fleet then based at Truk. On the night of February 3 two PB4Ys of the Marine VMD-254 Squadron, piloted by Major James R. Christensen and Captain James Q. Yawn, set off from a temporary strip hacked across Sterling Island. They were ordered to fly their photographic planes over Truk which lay more than one thousand miles to the northwest, and get tactical pictures of the Japanese Fleet base, in preparation for a carrier raid planned by Rear Admiral Marc A. Mitscher, and possibly for a troop invasion, which was still under consideration. In those days any mention of Truk was enough to make most service

men in the Pacific look for an out. It was the most mysterious and hazardous of Japan's many islands below the Equator.

The two pilots and their ten-man crews appeared over the target at 20,000 feet the next morning. They immediately spotted what looked like the bulk of the Japanese Combined Fleet, including the 63,000-ton battleship *Musashi*, one carrier, nine cruisers, twenty destroyers, and a dozen submarines, plus a gathering of cargo vessels.

At first Christensen and Yawn were unobserved as they aimed their cameras and clicked off lengths of film with no opposition, but before the full mosaic pattern was completed a battleship opened up and several Zeros, plus three seaplane fighters, came up to intercept. Nevertheless, the Marine pilots spent more than twenty minutes weaving back and forth over Truk to make sure they had the required information before they dove away and headed for the Solomons. Both aircraft had been in the air approximately twelve hours and had completed one of the most daring missions of the war.

However, the picture coverage was not complete, due to intermittent cloud layers, but the mission had an unexpected effect. Admiral Koga, already worried about his extended line and the fact that the Gilberts had been lost and the Marshalls just invaded, decided to abandon Truk. The sight of the two four-engined planes overhead sealed his decision. He sailed off aboard the *Musashi* for Yokosuka in the home islands with part of his fleet; the rest were ordered to Singapore.

About fifty merchant ships and auxiliaries were delayed by rough weather and three cruisers and eight destroyers remained behind with them. Truk's airfields, awaiting the arrival of the ferry pilots, were jammed with aircraft en route to Rabaul.

Thirteen days after the Marine photographic mission, Admiral Mitscher's carrier aircraft struck, and his surface ships helped wipe up the cripples. When it was over 200,000 tons of war vessels had been sunk; three Japanese cruisers had gone to the bottom, as well as three destroyers, two submarine tenders, an aircraft ferry, six tankers, three auxiliary cruisers, and nineteen cargo vessels. About three hundred airplanes were destroyed or damaged, as were storage facilities for food and fuel. Truk was left practically defenseless by this

Navy strike, but the Japanese considered the escape of their fleet as "a bright spot in the midst of our misfortune."

In that harrowing winter of 1943-44 when the U. S. Eighth Air Force was still valiantly proving itself and justifying the official belief in daylight precision bombing, the war correspondents who covered both fighter and bomber operations were continually beset with security regulations said to be necessary to meet the problems of wartime operations. The author's old notebooks are crammed with reflections, incidents, and references to the frustrations that beset us on all sides.

For instance, once the high-altitude raids over long distances became almost daily affairs, we noticed that the low temperatures over France or Germany were taking as large a toll as flak or gunfire of enemy fighters. As Fort after Fort rolled in, half of the crews crawled out almost helpless, stiff, numb, and sometimes screaming with pain.

The author had read of frostbite and death from cold and had walked long lonely roads in near zero temperatures and remembered the suffocating effect of intense cold; but until he saw U.S. air-crew members suffering from high-altitude frostbite, he had no idea what below-zero temperatures could do to the human frame.

"This is worse than a beat-up at the hands of the Abbeville Kids. What are we doing about it?" we inquired.

"What's the use of spending millions to train men, if they can't stand the conditions under which they have to perform?"

We were assured that new clothing was being issued, that electrically heated equipment would soon be available, that in-air discipline was to be intensified, that any air-crew member returning with serious frostbite would be court-martialed, that such carelessness could not be condoned.

Naturally, most of us wished to explain this situation. It was a factor of war that should be understood at home. In most cases these young men, risking their all, could not help what was happening to them. If a gun stoppage required immediate attention, they instinctively removed their heavy gloves to clear the stoppage, or to replace a broken part. There could be a dozen immediate reasons for risking frostbite. Also an aircraft might at the same time suffer

surface damage which added to the problem. A tight fuselage or cockpit will retain some small measure of the artificial heat being blown around the ship, but if great holes are hacked into the dural skin, the slip stream and propeller blast acts as a forced-draft Arctic storm, and interior temperatures drop to unbearable levels.

We felt that if we could interpret this manpower-draining situation to the people back home, we might in some oblique way help ease the situation. Something had to be done, someone in the States might have a brand-new idea, some physician or scientist might produce a new method of treatment that would salvage much of the skilled personnel loss.

But security took over. We were forbidden to write any frostbite stories; it might give aid and comfort to the enemy to know that American bomber crews were taking such a beating. We argued that the Germans must know, since we lost planes in every raid, and some of the crewmen landing in enemy territory must have shown the effects of frostbite; that their German interrogators would be rank amateurs if they did not inquire whether frostbite was a common occurrence.

"Well . . . publishing these stories does not help the war effort. We have a tough enough time encouraging draftees to volunteer for air-crew duties. Think of their fathers and mothers at home."

So we agreed to hold off or forget the frostbite situation, and in return we would be shown the new high-altitude clothing equipment as soon as it was available. There should be a good objective story in that.

Three weeks later a national picture weekly came out with a complete color feature showing all the horrible details of what frostbite was doing to the American bomber offensive. We can only presume that candidates for bomber air crews stayed away from the personnel office in droves.

Another factor important to American high-altitude bomber offensive was oxygen.

We could train the finest air crews in the world and send them to Germany with a load of very effective bombs. At the time we were designing and producing some of the most efficient aero engines, but none of it meant anything without a worth-while oxygen system. Without this respiratory aid we might just as well have

returned to the bow and arrow, or trained the crew in the use of the pikestaff or halberd.

All U. S. World War II fighters and bombers, as is well known, were equipped with an oxygen supply which in general was piped through the structure of the plane and made available through suitable outlets at the various crew stations. The individual members received this life-giving air through special masks fitted to their flying helmets, and if the main supply was cut off or damaged, extra bottles were at convenient points. If a crew member wished to move from his station to another part of the aircraft, he first had to uncouple his oxygen line from the main tank and hook in a small portable bottle which he took with him.

How soon an individual begins to draw on the oxygen supply, rests largely with him. Most World War II crews cut into it as soon as they reached 9000 feet. Others might notice no ill effects of thin air until at an altitude of 18,000 feet. The general physical condition of the individual had a great deal to do with it. For instance, a man with a severe cold needed more oxygen than when he was in normal health. Oxygen is absolutely necessary at 25,000 to 30,000 feet, the height at which our bombers generally flew when heading for enemy targets. Under proper control it can be the breath of life. On the other hand it may become a terrible weapon, treacherously working for the enemy. There were hundreds of strange and frightening stories based on the oxygen supply, and the many tricks it played on the crew members.

On U.S. war aircraft the main oxygen feed line was usually distributed through the various stations at low pressure, and was considered comparatively safe, so far as fire hazard was concerned, but even under low pressure it can become a wicked and highly volatile fuel. Oxygen can either keep a crew alive, or it can burn a bombe out in a matter of seconds.

One story told while the author was with the Eighth Air Force gives some idea of the importance of oxygen equipment and the problems connected with its use. It all happened on a Flying Fortress named *Hard to Get*. That she lived up to her name is a tribute to Staff Sergeant Adolph F. Frydel, a tail gunner who deliberately came close to making the supreme sacrifice, not only once, but four times.

The *Hard to Get* was on one of the famous Kiel raids when fifteen

minutes before it reached the target, flak cut off Sergeant Frydel's tail gun oxygen supply. A two-engined fighter came in astern to attack and Frydel stayed with his guns and drove off the German. He was without oxygen all this time, but managed to clutch to some degree of consciousness and eventually hooked in an emergency bottle and resumed his position behind the gun.

While this had been taking place Sergeant Marvin E. McManus, the ball-turret gunner, caught a burst of 20-mm fire in his jaw and a leg, but he too stayed in action and kept on firing his guns until the attacking ships had been driven off.

Once the sky was clear, McManus decided to crawl out of his turret and seek first aid in the radio compartment. He had to unhook his oxygen line to get there, but he remembered to hook in a spare flask before he started. However, he collapsed from shock and loss of blood outside the door of the radio compartment.

When he moved forward for an oxygen bottle, Frydel noticed that McManus was missing from his turret, so he went back to find out what had happened. He saw that McManus was seriously wounded and he immediately applied first aid, working fast to stop the bleeding so that Mac would be able to stand the rest of the journey back. The ball-turret gunner was living on his portable bottle of oxygen, but because of his injuries he was inhaling it at a rapid rate. Frydel sensed this and worked fast to stanch Mac's wounds.

It was a ticklish situation. A wounded gunner was passing out because in addition to his grave injuries, he was nearly out of oxygen. The man who was rendering first aid, the man most vital to Mac's safety, had to make a grim decision.

Without questioning the sanity of it, Sergeant Frydel unhooked his portable bottle of oxygen and switched it to Mac's mask and tried to continue his first aid. He lasted about ninety seconds and then fell unconscious across the wounded ball-turret gunner.

At this point they were directly over the target and *Hard to Get* was spewing high explosive from her bomb bays. Flak burst all around them, but the show had to go on. T/Sergeant Steve P. Bowen looked down from his top turret post and saw what had happened. He immediately brought up another brace of oxygen bottles and revived Frydel who then continued to give first aid and oxygen to his pal.

But again he ran into the problem of supply and demand; Mac was still absorbing oxygen faster than Frydel and passed out once more before the tail gunner's air bottle was exhausted. Four times Frydel gave up his air flask, and four times he passed out cold himself.

Once they had cleared the target, other members of the crew formed an aerial oxygen bucket brigade and eventually kept Frydel on his feet, thus enabling him to feed McManus the air and treat his wounds at the same time.

When they had returned to their base and Frydel's actions over that frightening period were questioned, he said, "Why not? He is my best friend. He was hurt much worse than I was and because he needed that oxygen more than I did . . . I gave it to him."

Had this been an impulsive gesture, something that flamed up within a man for a few seconds and drove him on to some glorious deed of gallantry, we could have understood it; but Sergeant Frydel deliberately risked his life four times! When you ask one of the pilots about these experiences they usually say, "That's how it goes. Sometimes everything happens on one raid. But if we are lucky, every man will be on the ball. They all know what they are expected to do, and if they do it—there you are!"

It was the same in ditching stories. If every man did what he was expected to do, they all stood a good chance of getting back, but even most ditchings provided dramatic situations. Some ended on a happy note, others had their share of tragedy and sacrifice, highlighted by heroism.

A Flying Fortress piloted by Lieutenant Robert S. Maupin went on a regular mission over Bremen, the second one for the crew. There was plenty of flak, but they went in according to schedule, dropped their bombs and then raced for their position in the returning formation.

They had also stopped their share of hate over the target, but at first there was no particular damage evident, and it wasn't until they were well on the way home that Maupin noticed an ominous glint in the fuel gauge. He knew what had happened and the co-pilot, Lieutenant Robert Kemp Zapp, went aft and tried to remedy the situation, but certain valve mechanisms had fouled. There was nothing to do but make certain that every member of the crew was

warned and sent to his crash station to prepare for a dip in the Ditch. Zapp then went back to his seat and readied himself for the pile-up.

"We hit with only one real jolt," he explained a few days later. "Actually, it was a beautiful landing. I didn't have time to fasten my safety belt—the ends were all tangled up somewhere at the side of my seat—so I had to brace myself on the rudder pedals. When we hit, I knew what I was supposed to do, but how I did it, God only knows.

"First, I somehow squeezed out through the tiny window beside my seat. An hour before I would have bet ten bucks I couldn't get through a hole twice that size.

"I found myself out on the wing, but the minute I tried to get to my feet a great wave hit me and, whammo, I went off into the sea. The waves were at least twenty feet high. I never saw Lieutenant Maupin after I left the cockpit, but I did see some of our men still on the wing outside the radio compartment window. I could just make out through the mist and waves that they were trying to launch several one-man dinghies. I tried to swim, but it was more of a mad struggle than swimming. I finally reached a free dinghy that had been tossed out. I worked to get it inflated but when I pulled the cord nothing happened, so I floated about in my Mae West. I was submerged to the shoulders and getting terribly cold.

"I still tried to get back to the rest of the crew by floundering and swimming and gradually made my way nearer the wreck of the Fort. I saw then that someone had managed to inflate a small dinghy and that four men were hanging to it. One man was floating about helpless in his life jacket—I think it was Lieutenant [Charles S.] Lail, our bombardier.

"I guess I was in the water about forty-five minutes and at one time about fifty yards from the others. I think the aircraft stayed afloat about a minute and a half . . . maybe longer. I turned to see how the single dinghy was making out and suddenly saw two boats! One was a British LC-I [landing craft-infantry] and the other a motor torpedo boat of some kind. You have no idea what this sight did to me. At first I thought that I might be seeing things, but there were two of them and I was willing to settle for either one."

When I talked with Zapp, he was resting and it was difficult to

get the full details. He did explain, however, that one of the two boats moved in gradually and he was picked up, made comfortable and carefully massaged by some members of the crew.

"I'd like to find out who those boys were," Zapp said. "They had a lot of courage in trying to get to us under those conditions. They actually leaped overboard, because I was in no shape to climb a rope. They also took plenty of chances that close to the enemy coast; and if I hadn't received valuable attention when I was taken aboard, I might have passed out, anyway. Try to find out who those boys were, will you? You see, they wouldn't give me their names, because they said they were rookies and were eight miles off their course. They didn't want their CO to know about it."

When Hitler was denied his plan to invade Britain in 1940, rumors began to circulate through the free world that the Germans would take their revenge on the stubborn British with a secret weapon. By late 1941 it was obvious that the threat of poison gas no longer cowed Churchill's sons and daughters and civilian gas masks were seldom seen in London. The time was ripe for a renewal of the "secret-weapon" yarn that had been a feature in popular magazines and Sunday supplements over the previous decade.

The Death-Ray was always good for a two-column headline. At other times it might be a new and more terrible form of lethal gas. Some articles referred to a high-frequency charge that would neutralize ignitions of all internal combustion engines. Military airplanes were shown tumbling out of the skies, for no apparent reason. In fact, one British scientist had actually stalled motor cars with such a device from a distance of a few hundred feet. Biochemists were consulted about the possibility of an enemy spreading deadly germs.

These were the popular views of the secret weapon, but by 1937 Great Britain had learned that the Germans were experimenting with a form of rocket projectile—first at Kummersdorf and later at Peenemünde on the Baltic coast. None of the magazine feature writers seemed to have thought of such a weapon, possibly discounting such propulsion which had been used since 1232 when the Chinese fired rockets at the Mongols. In 1379 rocket missiles were used by the Paduans at Chiozza and the next year by the Venetians.

Colonel William Congreve studied the rocket weapon in 1802 and

after some shilly-shallying by the British Army and Navy, was permitted to bombard Boulogne with racks of rockets set up on siege boats. The old town burned for five days. Later Congreve persuaded the British Army to establish rocket regiments that were composed of five officers, 170 men, and 160 horse-drawn vehicles, bearing rocket-firing racks. For a time it appeared that the rocket rack would displace field and garrison artillery, but the rifled tube, and improvements in nose caps and fuses finally won out, and the rocket was forgotten for years.

In 1915 the war rocket came to light again when the Le Prieur projectile was mounted on World War I aircraft and fired at enemy kite balloons. In 1928 rockets were built into Opel motor cars. They gave the vehicle tremendous speed, but the device had little commercial value at the time.

Lieutenant Colonel Walter Dornberger (later Major General) of the German Army, who had an undistinguished career in the First World War, became a gunnery and ballistics expert in the Weapons Department. In his spare time he wrote a small book, V2 which was not published until after World War II. It indicates that he had been a master mind in Hitler's buzz-bomb planning, although some authorities credit the new science to General Professor Dr. Carl Becker. At any rate, Germany was well ahead in the military-rocket field when Hitler began to march.

The idea of strategic bombardment with long-range aircraft had been retained in Great Britain since World War I, but apparently no one considered the rocket as a means of delivering a warhead. Some research had been made to produce an alternative to the expensive anti-aircraft gun, and from this emerged the rocket batteries which supplemented Britain's meager gun armament in the days following the retreat from Dunkirk.

The first German war rocket of any importance was developed by Professor Wernher von Braun, who, on October 23, 1943, fired his A4 (later called the V2) beyond the earth's atmosphere and covered a distance of 125 miles. The rest of the history of Germany's rocket arsenal is generally known, but we who were in London when the first salvos were fired in the summer of 1944, will not forget any of the details.

How much the British public or the war correspondents knew

previously is debatable. Those who wrote postwar histories appear to have known as much about the over-all rocket-bombardment plan, as did Hitler or Professor von Braun. Frankly, I knew nothing about Germany's secret weapon. All I knew was that there was a lot of tactical bombardment being carried out against what the Intelligence and Operations officers referred to as "the sites," and the actual attack was often referred to as a "Noball" mission. In those days we wasted little time on matters that were taboo, and wisely ignored cryptic references, which couldn't be written and published.

The "sites" were, of course, the launching sites of Hitler's secret weapons—targets along a so-called rocket-gun coast which had been discovered in time by an officer of Britain's Women's Auxiliary Air Force, Constance Babbington-Smith. Although she has always refused to take full credit, she did first link the appearance of some unusual structures on the northwest coast of France with the many reports of a rocket-propelled flying bomb.

Through the autumn of 1943 and on until the flying bomb sites were overrun after the invasion, British and American bomber forces continued to blast at these mysterious launching bases. The neutralization of these sites was called Operation Crossbow, and the mission was to destroy a number of targets, some said to contain as much concrete as Boulder Dam, some mere ski-type sites; very hard to detect.

The Battle of the Sites, as the operation became known, was carried out by the usual rules of trial and error; British and American commanders had little idea what they were shooting at and most of their planning had to be made on pure conjecture. British Bomber Command, the U. S. Eighth and Ninth Air Forces had a full share in the operation. By the middle of December 1943 many of the large sites had been worked over by the fighter-bombers of the British Fighter Command and by the B-25s of the Ninth Air Force, which together poured more than 2000 tons of bombs on the massive structures. The ski-type launching platforms received more than 3000 tons, which were dropped by the 2nd Tactical Air Force, Bomber Command, and precision bombers of the U. S. Eighth Air Force.

The bombing technique varied with the type of aircraft used. The Americans struck with the Norden bomb sight, while the British relied on their Oboe system. The tactical raiders used low-level at-

tacking Mustangs, Spitfires, and Mosquitoes. The latter technique was most interesting in that it possibly was the first time that these aircraft, so armed, were sent against small targets where precision delivery was so essential. The ski-type targets were usually hidden in small woods or low brush areas and were difficult to spot from low-flying aircraft. However, the woods themselves were generally easy to find; had the sites been set up in open fields and well camouflaged, the problem might have been harder.

The technique was to drop delayed-action bombs into the non-magnetic concrete shed which stood beside each ramp, and hope to destroy the equipment used in preparing the V-1 for its launching. These sheds had doors that were twenty-two feet in width, a measurement that generally coincided with the known wing span of the buzz bomb. It was believed that each missile was first taken to this shed and there primed, detonated, and generally prepared for its flight, and thus the destruction of this building became the chief objective of each assault.

The storage depots where the missiles were stacked were dealt with by high-level bombing with "Tall-boys" that weighed 12,000 pounds apiece.

The true burden of "Crossbow" operation can be appreciated when it is realized that 18,770 aircraft were flown in the over-all attack on the bomb sites and their storage depots. These aircraft dropped 23,560 tons of bombs; the Eighth Air Force neutralized thirty-five sites, and the Ninth Air Force disposed of thirty-nine. This great diversion of bomber effort from the attack on German cities and German industry needs explanation.

Once Hitler was convinced of the strategic value of the V-weapon, he decided that 5000 V-1s were to be fired every twenty-four hours. Had this plan been carried out, some 600,000 flying bombs would have been launched against the British Isles between June and September of 1944; instead, only 5430 were released which caused 6100 deaths and wounded 17,300 people. Approximately one million homes in Greater London were destroyed or damaged. Had the planned 600,000 V-1s landed on British targets, the loss would have been one hundred times greater, and if the weapons had been fired at the assembly and take-off areas of the invasion forces, there

might have been no invasion of Normandy. According to some officials it might have meant defeat for the Allies.

The winter blitz of 1940 was a mild strain on the nerves compared to that created by the V-1. A bomb from an aircraft fell swiftly and the destruction was soon over, but the long-drawn-out threat of that pulsating, flaming terror coursing unrelentlessly across the sky was a more shocking form of mental torture. The effects of the later V-2 were purely physical, since unheard and unseen, its explosion was the first sign of trouble, and as these types fell in a very scattered pattern, and the numbers were relatively small, the morale effect was slight.

The buzz bombs provided a new sort of air hero. The intrepid fliers of two world wars and the so-called police action in Korea have given literature, the theater, and the silver screen enough heroic material for several decades, but the buzz-bomb fighters, and in particular Captain Jean Maridor, seem to have been ignored.

When the first Nazi missiles hissed across the English Channel at the psychological moment that General Eisenhower had started the invasion into Normandy, the V-1 could have foiled the Allied plans and prolonged the war for years. Those in London during those frenzied days realized what an effect the German missile had on the war-weary men and women of Great Britain. Night after night they breathed, "Thank God for allies like Jean Maridor."

The only weapon capable of fighting the buzz bomb, once it was launched, was the high-speed fighter. Ground gunnery was impossible. The young gods in Spitfire-9s, Typhoons, or Tempests, Britain's latest fighters, had to intercept and destroy! The buzz bomb had to be shot down, or forced off course before it reached London. It was a difficult target, and so fast that even the fighters of 1944 had to approach in a dive in order to overtake. It was a small object in daylight, but at night its flaming tail gave a better indication of where it was. One of the most serious problems faced by the pilots was to estimate the correct distance from the target at which to open fire. Long-range sniping was ineffectual and a too-close approach meant the attacker's destruction in the resultant explosion. Some especially dedicated pilots flew close to the missile, put their wing tips under that of the bomb, and with a sharp lift, tilted it over into a nose dive to earth, away from congested areas. Finally, a very

simple gun sight was invented by Sir Thomas Morton, and the number of kills increased.

Thirteen single-seater and nine two-seater fighter squadrons were engaged in this battle, and all efforts were made to increase the speed of the aircraft by stripping off anything not essential to the task; camouflaged paint was removed, and all metal surfaces highly polished to reduce skin-friction drag.

Jean Pierre Maridor, a young Frenchman, was one of these buzz-bomb heroes. He was not quite twenty when he escaped the Nazi invasion of France and arrived in England in 1940. In his teens he had been a barber's apprentice and with the few francs he received in tips, he had bought some flying lessons at a school near La Rochelle.

When Hitler marched in 1939, Maridor was taken into the French Air Service and in the little time left was made a fighter pilot. The first serviceable aircraft to come under his command had to be destroyed; there was no available fuel to fly it, and since it had to be kept out of the hands of the invaders, Jean put the torch to it himself. He then escaped to England with hundreds of other young Frenchmen.

During the next four years he fought with a mixed group of French, Belgian, and Dutch comrades in the Royal Air Force. His first missions were against German flak boats, and then he took part in various forms of escort duties. On his low-level intruder raids, he must have hated doing any damage to the towns and cities of his homeland.

In England, Jean met another Jean, Section Officer Jean Lambourn in Britain's Women's Auxiliary Air Force. She was one of the few persons who sensed his deep inner yearnings to return to France. They were to be married on August 11, 1944.

On June 6 the Allies landed on the Normandy beachhead and a few days later Hitler's first buzz bombs nosed into London. While most of his countrymen had joined the armed swarm bent on liberating France, Captain Maridor was kept in England—to fight the buzz bombs.

In less than three weeks he had destroyed ten!

By now he was a hero. His chief, General Martial Valin, called him the "Georges Guynemer of World War II." The London County Council later named a street for him.

On August 3 he went after his eleventh buzz bomb. The sun rose bright and early, and quickly dissolved the billowing summer clouds. The skies over the cliffs off Beachy Head were buzzing with a swarm of hornet aircraft. One after another, the Spitfire-9s took off and in his turn Maridor climbed into his cockpit.

Two hours before he had patrolled with his squadron for forty-five minutes without seeing a single V-1, but now British radar stations were reporting a number of flying bombs. Perhaps Section Officer Lambourn was on duty that morning to play her part in this dual tragedy. However, the simple facts of the matter are drama enough.

Captain Maridor started his engine, carefully went through his routine cockpit drill and moved out to the runway. The Spit gathered speed as he headed for the coast. Across the Channel he could clearly discern the smoke of battle in France. He switched on his gun sight, regulated the flow of clean air into his cockpit and armed his wing guns for action.

His radio spluttered something unintelligible.

"Hello! Come in . . . hello! Hello!"

There was no immediate reply but Maridor kept climbing to cover his assigned area.

"Hello! Trident Base to Red 11." (This was a warning to Maridor.)
"Diver at three o'clock from you. Three thousand feet!"

With the reaction of a trained airman, Maridor advanced his throttle and checked his compass. He sensed that the buzz bomb was heading for the British coast somewhere between Winchelsea and New Romney.

Suddenly the German V-1 loomed before him, a mottled cigar-shaped item with a pair of stubby wings. An impulse duct engine was set above the fuselage which sped it on its 360-mph journey of death. In the air, compared to the Spitfire, it was toylike, but in its nose was a 1000-kilogram warhead of high-blast-effect explosive; enough to completely destroy a modern apartment house.

Maridor went into a power dive and roared after the winged missile which was now throwing off a cluster of sparks in defiance of the futile antiaircraft fire from the ground. A touch of the elevator and the Spit leveled off. Maridor leaned back against his headrest and centered the V-1 in his gun sight. He gave the Spit full throttle and closed with the ominous intruder.

The nearer he closed, the clearer were the details of the flaming exhaust. The air-speed indicator showed 375 mph and then stretched out to 400. The spluttering target grew bigger and bigger.

Maridor pressed the gun button with calm deliberation; flame, smoke, splutter, and sparks billowed in reply. The buzz bomb seemed to be hit; it staggered, flipped over, and began a helpless sideslip toward the earth.

A short distance off to the left at the top of a low hill that was surrounded by a woodland, stood an old ivy-covered hospital. Its roof was plainly marked with an identifying red cross. One wonders if the young Frenchman had noticed it before in his many patrols back and forth over that area. He had seen hundreds of Allied and German wounded brought in from the invasion front. It could be filled with the victims of buzz bombs—men, women, and children.

Whatever his thoughts, Maridor knew that the spluttering bomb had not exploded in mid-air, as he had planned; it was heading in an unreasoning, unguided sideslip toward a cluster of buildings, and there was a hospital down there.

Maridor sized up the situation, rammed his stick forward and roared for a position immediately behind the diver. Again, the ground swept up to him and he knew he had but a few seconds to destroy the bomb before it fell in the little English village.

With perfect control, he fired again at close—dangerously close range. The target weaved in his sight. Fields, roads, and houses rushed past at 400 mph. Jean gave the bomb several short bursts. There was a temporary blackout, caused by the broil of speed and the tricky maneuvers that drenched the blood from his brain. In that dread second the Spit closed in again and Maridor saw the buzz bomb for the last time.

He pressed the trigger; all four guns spat together and there was a tremendous explosion.

The buzz bomb blast tore off both wings of the Spitfire and fragments of metal riddled the cockpit and fuselage. The wreckage spun, the prop ran wild, and the wingless hulk crashed into the hospital garden. Watchers in the hospital and in a nearby school stood glued to the spot. They were unable to realize fully what had happened, or that they had escaped a catastrophe. Only the hospital matron, Mrs. Barbara Sharp, sensed the manner in which Captain Maridor

had died. She wrote to Miss Lambourn: "As you can imagine, it all happened so fast that we did not have time to see very much. But in trying to save the hospital and the school where we live, he flew too close to the flying bomb. This act of bravery saved the lives of the wounded soldiers here, and of many small children in the school. I feel this is not enough to console you, but it is the best I can say."

Friends of the Lambourn family who had been invited to the wedding received a poignantly concise announcement:

Mr. and Mrs. Lambourn regret to inform you that the marriage of their daughter will not take place. They have just been informed that Captain Jean Maridor of the French Air Force was killed this morning.

Aug. 3, 1944

A short while later I was informed by the Royal Air Force that Captain Jean P. Maridor had previously been awarded the Distinguished Flying Cross on November 22, 1942, and that his record included the destruction of ten enemy aircraft. He had also sunk twenty-five boats and on one occasion had singlehandedly attacked twelve F-W 190s off the English coast. His own country honored him with the Croix de Guerre. Today, the Club Maridor, at 22, Avenue President Wilson, in Paris, is a perpetual international club for members of the Allied air forces.

On July 20, 1944, I was back in England after my first visit to the invasion front. I returned mainly to get some magazine material censored for publication. On the way back to London I had another unpleasant experience, such as was the lot of correspondents then. I had written to my wife, "I have just returned from a fighter base where I had been interviewing a well-known American ace. I had taken notes on some of his story and he had autographed a couple of his photographs for me. He was due to go home for a ninety-day leave the following day and he told me he would probably sleep late and give me the rest of his story at lunch. Instead, he went on one more mission—the damn fool—and you know what happened. He didn't come back, unfortunately, and I can't write the full story yet for reasons I will explain later."

The American ace was Lieutenant Colonel Francis S. (Gabby) Gabreski. At that time he was credited with 31½ enemy aircraft and was said to be tied with Major Robert S. Johnson, another Thunderbolt pilot. It was explained later, however, that Johnson had only twenty-eight, and as usual the figures were juggled around so that we had little idea what was what. In my notebook I had jotted down the actual details of thirty credited to Gabby, and he may have gone out once more to get another, so as to return home as the leading American ace in the European Theater. However, he has always denied this.

Gabreski was one of the most colorful of American pilots, but one of the least known. Today, he is the leading surviving American ace, as he continued on in the Korean conflict and raised his total score to 37½. He is still on active duty with the U. S. Tactical Air Force.

I know him well. I have visited him at his base in the United States and in his home, and he has not changed a bit since that memorable day when I interviewed him in Britain. At the time Gabby fascinated me. He was a stocky, friendly type with sharp black eyes that had flicks of yellow lights and warmth. He did not appear to be the dedicated type, but he most certainly was. On the ground, in the Officers' Club, or on a leave train, he was a pleasant, comfortable man. In the air, he must have been a hellion!

Gabby was unlike any leading airman I had encountered and I had met some of the best in two world wars. He came from immigrant stock. The family name was Gabruszewski, which the sons soon changed to Gabreski. His father had been a railroad laborer, and his mother worked as a scrubwoman in the Catholic church in Oil City, Pennsylvania, Gabby's home town. Stanley and Josephine Gabruszewski had four other children; Thaddeus who became a doctor, Max a lawyer, and Lottie and Bernice.

Gabby was unlike the others. He was not a scholar, but as his brother Max explained, "He had a good social intelligence." Actually, he was something of a problem and only Old World family discipline kept him out of real trouble. As he grew up he was called Frank, and the girls seemed to love his flashing eyes and massive shoulders. He entered Notre Dame in 1938 to start a medical career, and held a job on the side, washing glasses in the college laboratory. He also sold household items door to door and spent most of his

money for flying lessons at a small aviation school near the campus, but after eight hours of dual instruction he had still not soloed.

During the winter of 1939-40 his father was in financial difficulty, so Gabby quit Notre Dame and applied to become a cadet in the Army's air-training program and was accepted. He was no world beater as a pupil and his instructors had to give him extra time to get him past the primary requirements. By the middle of 1941 he was a second lieutenant, attached to Number 45 Fighter Squadron at Wheeler Field, Hawaii, and was there when the Japs struck on December 7.

The shock of the attack seemed to have made a man of Gabby and he offered a new idea; namely, that since he spoke Polish he could be assigned to the R.A.F. as a liaison officer with the Polish squadrons in that service. His suggestion was accepted and early in 1942 he was en route to London.

He reported to the embryonic Eighth Air Force Command in England, but they had no specific job for him, and he wasted many valuable months desk-flying. One day he introduced himself to some Polish officers who wore R.A.F. wings on their jackets and this resulted in Gabby's being assigned temporarily to the Polish 351st Squadron which flew the latest model Spitfire.

He went on bomber-escort sweeps over Belgium and France but saw little air combat. Then one morning in January 1943 a squadron of snub-snouted Focke-Wulfs burst into view, but nothing he did at this time presaged the killer he was to become. He met enemy fighters twice in the next month, but they got away unscathed. Gabby admitted later that all he had absorbed from his air experience with the Poles was their passionate belief in the war, and some of their very aggressive spirit.

He spent three such months with the 351st and then was ordered to join the American 51st Fighter Group which had arrived in England late that spring. Gabby was jumped a couple of grades to major and made the squadron operations officer. The 51st flew the new P-47 Thunderbolt, which had not as yet been sent against the Messerschmitt 109s or Focke-Wulf 190s.

Gabby's first kill came in May 1943 when he shot down a 109 near Paris, and from that day his score mounted rapidly. He was one of the first Americans to score five times to become an ace and thus

earn some mild fame, especially in Oil City. His Number 61 Squadron, sometimes known as the Avengers was the first to destroy one hundred enemy aircraft. Gabby was promoted to lieutenant colonel and awarded nearly every American decoration, except the Congressional Medal of Honor. The British honored him with their D.F.C., and the Poles contributed their Cross of Valor.

Gabby's long tour of duty was to end early in July of 1944, and he arranged that when he was sent home, Kay Cochrane, his sweetheart whom he first met in Hawaii, and he would be married. Oil City, Pennsylvania, prepared a triumphant homecoming with a big parade, flowers and luncheons, and fraternal organizations raised \$2000 as a nest egg toward a home after the war for Kay and him.

The invasion had been set off, and as Gabby's leave papers were somewhat delayed, he continued to fly, rather than sit around. At least that is one story.

When he was half through the account of his episodes which he was relating to me, he begged to be let off until the next day. He had some British friends coming in from London as his guests in the mess that evening, so we planned to meet again for lunch the next day when I hoped to have most of his story in type for his approval. At the dinner that night we warned Gabby to take it easy from now on as his papers were in order for him to return to the U.S. the next morning.

"None of this 'one last flip' business," we admonished. "Remember what happened to Cobber Kain . . . and some others."

"Not me," Gabby laughed. "I'm going home to get married. I've been away from that gal long enough, and she's waited long enough, too."

The next morning I breakfasted alone and by lunchtime began to look around for Gabby. It was then that I noticed an air of mystery and uncommunicativeness; the public relations officer avoided me and members of the squadron gave me a dull eye. Finally, after the Group had returned from an early morning mission, Colonel Dave Schilling took me aside and explained. "Look, you're the only reporter on the base and we want your co-operation. Gabby is down on the other side."

"Down? But he was supposed to go on leave today."

"Sure. But you know Gabby. He had some idea about getting in just one more before he left."

"He was to meet me at lunch and give me the rest of his story."

"Okay. But right now we want you to keep him under cover. Write or say nothing about him until we tell you."

"But Gabreski is big news. If he's missing, how are you going to keep it quiet? Every GI on the base will write it home or blab it in some way."

"Please do as I ask. Gabby is down, but from what we saw, he has a good chance to get to the underground and get out in about two weeks. The base workers here think he landed at another field in order to be near the air transport base from where he would fly home."

"You want to hold the story for two weeks?"

"Give Gabby a break."

There was nothing to do but give Gabby a break. I had one of the "best" stories of the war, but couldn't write it.

What had happened, according to Gabby who told me the story later on, was that on his 166th combat mission, he had gone down to shoot up a line of enemy road transport and in doing so he had flown so low over a hard road that his .50-caliber slugs ricocheted back up from the hard pavement, and he flew into them, damaging his engine and propeller. In other words, Lieutenant Colonel Frank Gabreski had shot himself down!

This point has been debated on numerous occasions, but that is what Gabby told me when I met him in California many months later.

After I had agreed to sit on the Gabreski story, and after everyone in the know had been warned not to mention Gabreski's loss, and after the story had been carefully planted that Gabreski had landed on another field, the whole ludicrous secrecy was made more ridiculous by the good intentions of Brigadier General Leon W. Johnson, the hero of the Ploesti raid.

That afternoon at Halesworth, a decorations parade was held in front of the hangars and every airman who had been decorated over the past few weeks was brushed and polished for the occasion. The general who had come up from London to make the awards, opened up over the public address system with the words, "Gentlemen of

the 56th Fighter Squadron. Before beginning the main part of this afternoon's program, I would like to express my deep regrets on the loss of Lieutenant Colonel Gabreski, who was shot down in enemy territory this morning. . . ."

Four days later, Gabreski, who had been making fair headway in getting to an area where the underground could pick him up, was trapped by a group of Luftwaffe officials.

"Hello, Gabby," they greeted him, as they pulled him out from the shelter of a roadside shrine, "we have your old CO, Colonel Zemke, waiting to meet you. It will be quite a reunion for you Thunderbolt boys."

When the war ended in Europe, Gabby was still a prisoner and about twenty pounds lighter in weight. He arrived back home in America eleven days after the wild celebrations of V-E day. In Oil City, the Gabreski Day celebration had been completely forgotten, and the \$2000 purse had long since been returned to the individual donors.

While the air aces were the top headliners, whether they were running up high scores or tumbling into enemy territory, the bomber boys of the Eighth Air Force and the R.A.F. continued to strike at German industrial centers. Later consideration disclosed that enemy production was cut in half and held to that level. Ball-bearing shortages were reducing the output of tanks and other heavy military equipment.

During April 1944, the Eighth and Fifteenth Strategic Air Forces destroyed 1300 enemy aircraft in sky battles. New names appeared in the war news. Howard, Gentile, Johnson, O'Connor, Mahurin, Beeson, and Duncan. In March the new Mustang Group, commanded by Colonel Donald J. M. Blakeslee downed 156 enemy planes.

The fighters also developed special bombing techniques. Only a fighter can swoop low and drop a bomb within the entrance of a railroad tunnel to pile up a transport system inside a mountain, or glide in diagonally to skip-bomb the piers of a great bridge, or the locks of an important canal. The P-38 Lightning fighter groups also developed a technique of precision high-altitude bombing, and their speed made enemy interception most difficult.

By mid-1944 the Luftwaffe could no longer prevent Allied bombers from attacking any portion of the Reich. Again the oil refineries and the synthetic plants, which pumped the lifeblood into Hitler's mechanized army, became prime targets. In May heavy bombers, escorted by fighters, attacked the synthetic oil production facilities at Brück, Merseburg, Böhlen, Zeitz, and Lützen. On May 22 a total of 1756 heavy bombers struck at other oil targets.

Meanwhile the Fifteenth Air Force in Italy was again attacking the major refineries in the Ploesti area. About 40 per cent of Hitler's oil went up in fires set by this almost forgotten air group. At one time the German war machine had consumed 1,400,000 tons of gasoline and oil a month, one half of which had come from these Rumanian oil fields, and synthetic oil refineries in southeastern Europe and the Balkans.

As the enemy air opposition decreased, the Fifteenth could risk its full strength in the campaign, and from April 1944 on, the German fuel supply was cut by approximately 564,000 tons a month in these persistent attacks against the refineries in Rumania, Austria, Hungary, Czechoslovakia, Poland, Germany, and Yugoslavia.

But the Ploesti supply continued to needle the American planners, and a new drive was planned to evade the 250 heavy guns, interceptor nets, and smoke screens which made Ploesti the third most heavily defended target on the Continent. To penetrate these defenses, a straight drive at the complex was set up, designed to stage an aerial battle that would weaken the fighter defenses on succeeding days. Also, the fighter opposition was drawn off by diversionary moves. On one such occasion the P-38s flew one of their longest missions.

This campaign steadily reduced enemy fighter opposition, but the flak and smoke screens were still formidable. The latter were overcome by instrument bombing and by reconnaissance pilots who preceded the bombers over the target and radioed the information that enabled the bombers to hit targets covered by smoke.

Ploesti was finally knocked out in a three-day assault in August. In twenty-three attacks, nineteen of which were carried out by the Fifteenth Air Force, the bulk of its production was denied to the Nazis. Our final cost was 270 aircraft lost and 2227 airmen missing.

Although the Fifteenth Air Force ranged all over southern Europe to strike at German war industries and communication lines, its

heaviest attacks were made against the Balkans, particularly against the Balkan capitals, and by the end of October when the Russian drive to Budapest overran almost all of that area, 78,000 tons of bombs had been dropped.

As an aid to the Soviet Union, a system of shuttle bombing was inaugurated and on June 2, Flying Fortresses, escorted by Mustangs, flew to Soviet bases and bombed Hungarian rail yards en route. On their return from the U.S.S.R. they attacked air bases on the lower Danube; and on another occasion, on their return to Italy, they bombed air bases in Rumania. This system was later expanded into a three-way shuttle by Eighth Air Force bombers flying out of England.

The Twelfth Air Force, commanded by Major General John K. Cannon, was the American component of the Mediterranean Allied Tactical Air Force, another hard-working, but little publicized command. Primarily, its role was to operate with and assist the ground forces in the Italian campaign and in the later penetration of Axis Europe. The Twelfth also demonstrated in its "Operation Strangle" the ability of an air force to create an interdiction on such a scale as to have a marked effect on the battle for Germany itself.

This air plan was aimed at reducing the flow of enemy supplies by attacking the chief system. It was estimated that the enemy's ability to supply, reinforce and shift its forces could be so weakened that it could neither withstand ground attacks nor withdraw in order.

In "Operation Strangle" medium and fighter bombers attacked key bridges on the few rail supply lines from northern Italy to the front. From March 24 until the fall of Rome two principal interdiction lines were maintained across the narrow boot; no through trains were able to run from the Po Valley to the front line, and south of Florence practically all supplies had to be moved by truck.

The Germans attempted to increase their shipping, but our heavy bombers attacked key ports, and coastal aircraft wrecked the vessels. They then tried to divert motor trucks that were hauling supplies, around the broken bridges, but fighter strafing forced the trucks to operate only at night. As a result the enemy supply capacity was reduced from an estimated 80,000 tons a day to about 4000 tons per day in a twelve-week period of "Operation Strangle." In six months the Twelfth Air Force tactical bombers destroyed or damaged 12,190

vehicles, 9083 railroad cars, 788 locomotives, and more than 1000 bridges of various sizes.

The medium bombers and fighters working directly with the ground forces, hit troop concentrations and headquarters, ammunition and supply dumps, and gun emplacements. The Germans had to retreat to the Pisa-Rimini line, making the shift largely by motor vehicles.

On August 15—D day in southern France—the Twelfth Air Force helped to provide air cover for this invasion by softening up the coastal defenses and hammering at the lines of communication, while their own troop carriers were transporting American and British paratroops and glider forces inland. They played a large part in the strategy designed to keep the enemy guessing; identical attacks in type and intensity were made on targets in southern France and north-west Italy.

The Allied advance was so swift that aviation engineers were hard put to prepare airfields fast enough to keep the Thunderbolts within close range of the German Nineteenth Army. The problem was also aggravated by the difficulty of obtaining sufficient gasoline, oil, and supplies. A-20 bombers, B-24 Liberators and C-47 transports were used to bring up these necessities.

While northeastern France was being cleared of the Germans, the Twelfth's fighter bombers again turned their attention to Italy by assaulting German communications and behind-the-lines targets in the Po Valley and northwestern Italy. Their bombers continued to attack rail yards and port installations when priorities and weather permitted.

These almost-forgotten operations in the Mediterranean were on a tremendous scale. Beyond the bomb tonnage dropped and the battles won, they were outstanding in the development of tactical air power, and in the evolution of effective joint command co-operation between ground, air, and Navy, and between the U.S., the British, the French, the Yugoslavs, and other allies.

It is simple to speak of "one hundred per cent" co-operation, but how difficult it is in a war theater to weld two vast organizations such as the R.A.F. and the A.A.F. with different equipment, varied experiences, and many diverse elements, into an integrated whole. Yet it was accomplished in the Mediterranean and in Western

Europe, and the lessons learned in management and co-operation were a major contribution to the united prosecution of the war.

D day in France should have been a field day for the Luftwaffe. Thousands of boats, ships, and landing craft were chockablock in the English Channel, the skies were filled with glider-towing aircraft, and other sluggish types were following in with critical supplies. A dominant German air fleet could have spread wide havoc. Their success in the initial phases of the war was due to their strength in the air, combined with their armored force on the ground. They must have been aware of their opportunity, but the Luftwaffe was grimly depleted even though it had husbanded its resources in the hope of providing violent opposition to Allied air attacks on vital targets.

On D day when Allied forces, sea, ground and air, struck at the most vital target of all—the overland route to Berlin—the Luftwaffe failed to put up a good show. The U. S. Air Force and the R.A.F. had made this almost impossible.

Throughout twenty-five days in May the Eighth Air Force dispatched heavy formations of bombers and fighters into enemy territory. The Fifteenth carried the battle to the enemy for twenty-one days of the same period. Commanded by Major General Hoyt S. Vandenberg, the Ninth Air Force which had been organized for tactical offense, had rapidly grown to be the largest single force of medium and fighter bombers. From May 1 to June 6 the Ninth flew more than 35,000 tactical sorties—more than a thousand a day—in preparation for the landings. Its targets were enemy airfields, railroad yards, transport, coastal gun positions, communications, and bridges, which ranged from the Netherlands to the Pyrenees.

Just before Allied troops stormed the Normandy beaches, the heavy bombers of the U.S. and British services joined their naval forces to smash the beach defenses. For a time these targets were cloud-covered and Pathfinder techniques had to be used, but for one hundred miles inland much high explosive was dropped on all vital targets. Few pilots reported seeing any enemy planes.

When D day finally arrived much of the tension was released. Although secrecy had been the watchword for weeks previous, there were definite signs of activity everywhere. The heavy bombers struck at targets that were not strictly strategic; fighters ranged over new

territory to bomb and strafe targets that had not been molested before; photo reconnaissance squadrons were taking pictures by the mile. Weird conditions prevailed on the airfields; any pilot forced down at a strange base had to stay there and could not explain his whereabouts over the telephone; officials or visitors who arrived at the bases could not leave, business or no business. When the crew chiefs received orders to paint broad black-and-white stripes on wings and fuselages of all aircraft, it was realized that D day was at hand and every pilot who could crawl into a plane, argued to go. Rank was pulled left and right, and at one airfield there was not one second lieutenant among the pilots who flew on the first mission of the invasion.

Amid the studied confusion of this great operation, three small motor launches which were equipped with lights and radio beacons to guide the airborne troops, chugged through the Channel and took up positions in a line. As night fell the Ninth Troop Carrier Command dispatched the Allied airborne army in C-47s and towed gliders. Not all went according to plan; mistakes were made and there were periods of complete disorganization, but considering the vastness of the operation it was probably as good an effort as could have been expected. The airborne troops that were properly landed in their drop zones, spent the next few hours operating behind the enemy lines, disrupting communications, seizing crossroads, and cutting rail lines.

Flight Officer R. B. Fowler crash-landed his glider in a Normandy field and was taken prisoner, and marched off to a German regimental headquarters for questioning. A few minutes later the headquarters was attacked by U.S. fighters which were drenching everything with .50-caliber fire. In the excitement Fowler picked up and hurled an enemy hand grenade, drove his captors to cover, escaped through a window, stole a German motorcycle and returned to the American lines. Another glider pilot, Captain William J. Adams, talked 156 Germans into surrendering after they had taken him prisoner. The first few hours of the invasion were full of such incidents.

In the initial phase of the invasion the Ninth Troop Carrier Command dispatched 1662 aircraft and 512 gliders; 17,263 troops, 110 jeeps, 504 artillery pieces, and more than 2,000,000 pounds of combat

equipment, and supplies were landed behind the enemy lines. Only forty-one aircraft were lost.

Still, according to General H. H. Arnold's report to Secretary of War Stimson, there was little sign of the Luftwaffe. The failure of both the German Air Force and the U-boat service to take advantage of the ideal targets offered, hurt Nazi morale. With the beachhead secured, the Allied ground-air team went into action. The infantry took the brunt of what opposition was put up, while the air forces took over the role of downfield blockers; the footsloggers carried the ball.

It will be noted that the Seine running from Paris to Le Havre, and the Loire running from Orléans to Nantes form a rough right angle which encloses Normandy and Brittany. Except for a short gap between Paris and Orléans to the south, all traffic into this triangle must pass over the rail and highway bridges crossing the Seine and the Loire. Through May the Ninth Air Force medium bombers and fighters employed new techniques that broke down every major bridge over the Seine from Paris to Le Havre. This prevented any fast shuttle of troops from the Pas de Calais area into or out of Normandy. The devastation, however, did not indicate clearly our proposed point of invasion which could have been anywhere along the coast on either side of the Seine.

On D day the A.A.F. and the R.A.F. began sealing off the battle area that was enclosed by the two rivers and the short stretch between Paris and Orléans. Germany had large troop concentrations in the Pas de Calais area and in the south of France, and her plans for the defense of the Atlantic Wall were to shuttle large forces to the point of attack, but Allied air attacks on transport and lines of communication prevented any immediate reinforcement movement. The First SS Panzer Division had to make four detours out of the Ghent area to Normandy and reached the battle front ten days later, and because of these delays it could not arrive as a striking force but was compelled to dissipate its strength in holding actions and harassing attacks.

Another Panzer division required five days to move from central Galicia to eastern France and another two weeks to reach the front. An infantry division had to detour from Holland to the east through Alsace-Lorraine, back west to Paris, and on foot the rest of the way.

Some units of the German 276th Infantry marched for two days from south of Bordeaux to reach Le Mans in Brittany. From Le Mans they fought their war on trucks, bicycles, and on foot; some elements took ten days to travel less than one hundred miles.

When replacements arrived they were tossed into action piecemeal. Some regiments were limited to one meal a day. German ammunition that was shipped from Strasbourg and Metz went to Paris by rail, and then had to be loaded on barges and towed east, away from the front, up the Seine to Elbeuf and transferred to motor trucks. Only ten rounds per day were allowed for testing machine guns at the battle line, and all test shots with heavier pieces were prohibited, unless absolutely necessary. There was also a shortage of equipment needed to extinguish fires that were set by our shelling and our bombing. All this played an important role in the Saint-Lô breakthrough, for on the eve of that action the Germans could scarcely move twenty-five miles in any direction on any railroad without encountering a block.

This is what is meant by interdiction, and it is generally conceded that no such degree of interdiction had previously been put down on any major battlefield.

While the Allies were clawing their way past the captured Channel ports, and Paris, and roaring for the German border, the biggest naval action ever recorded—a combination of three major engagements—was being fought in Leyte Gulf in the Philippines. It resulted in practically demolishing the Japanese naval power.

This combined action occurred during October 22–27, 1944, in the Surigao Strait, off Samar, and off Cape Engano, when a force of 166 U. S. Navy vessels and 65 Japanese surface craft were thrown into the action. U. S. Naval aviation put 1280 aircraft into the battle, while the Japs could muster but 716 planes. Unlike most naval actions of World War II, it included every element of sea power from submarines to airplanes. It dwarfed the famous Battle of Jutland in distances, tonnages, and casualties. The battle for Leyte Gulf raged over an area that was twice the size of Texas.

The Japanese version of the outcome distorted the facts considerably. Tokyo officials assured their people that 19 American aircraft

carriers, 4 battleships, 10 cruisers and destroyers had been sunk, and 1261 "barbarian" Yankee airplanes shot down into the sea.

There was no question which side won this sea classic, but postwar appraisals provoked many interservice controversies.

This battle for Leyte Gulf which was fought during the U.S. invasion of the Philippines, became a death trap for the Japanese before the area campaign was over. Admiral Soemu Toyoda had little naval equipment of importance left to fight with. Earlier losses in the Battle of the Philippine Sea, and his futile defense of Formosa, left his fleet vulnerable to air attack, and in addition his naval forces were spread out over hopeless distances when he most needed every element. His final plans were shot through with serious strategic deficiencies.

Possibly his most important weakness was the pathetic condition of his carriers. He had one heavy carrier and three light carriers, which combined could put only one hundred aircraft into the battle. Their pilots and air crews were either physically exhausted or inexperienced. This was all that was left of Japan's once powerful carrier fleet.

The opposing U.S. forces were divided under the commands of Vice-Admiral Thomas C. Kinkaid of the Seventh Fleet, and Admiral William F. Halsey, Jr., of the Third Fleet. Kinkaid's covering force was built up behind the gunpower of six old battleships, five of which had been retrieved from the mud and carnage of Pearl Harbor, but more important, he had sixteen escort carriers—small, slow-speed vessels hurriedly converted from merchant hulls—eight destroyers and scores of destroyer escorts. It was Kinkaid's job to provide shore bombardment and close support for the invasion troops, and anti-submarine and air defense for the amphibious forces.

With eight large attack carriers, eight light carriers, six fast new battleships, fifteen cruisers, and fifty-eight destroyers, Admiral Halsey was ordered to cover and support the forces of the Southwest Pacific in order to assist in the seizure and occupation of objectives of the X and XXIV Corps on an eighteen-mile front between Dulag and Tacloban.

When U.S. submarines *Darter* and *Dace* intercepted part of the Japanese fleet in the Palawan Passage on October 23, the battle for Leyte Gulf was opened. The *Darter* put five torpedoes into the heavy

cruiser *Atago* at 1000-yards range. The *Dace* hit the cruiser *Maya* with four torpedoes and she exploded and sank within four minutes. The next day, encouraged by this, Admiral Halsey launched search planes to sweep a wide arc covering the approaches to San Bernardino and Surigao Straits. Whether the reports of his reconnaissance pilots misled him, or whether he committed an error of judgment, has never been clearly defined, but he obviously fell for a ruse.

Admiral Shoji Nishimura, who should have steamed through the Surigao Strait to block off the invasion forces, was outwitted by Rear Admiral Jesse B. Oldendorf's battleship force and what Oldendorf didn't send to the bottom, were taken care of by U.S. carrier planes. Only one lone destroyer is said to have escaped. When Admiral Takeo Kurita took up the gauntlet and tried to pass through San Bernardino, the U. S. Task Force 38 was ready for him. The new 63,700-ton *Musashi*, said to be armed with ultrasecret 18.1-inch guns, soon went to the bottom with ten aerial torpedo and sixteen bomb hits. Other pilots of this force also claimed to have crippled two more cruisers and damaged two battleships; reports that Admiral Halsey later said were "dangerously optimistic."

Whether or not he carefully evaluated these claims, Halsey next sent his Third Fleet after Admiral Jisaburo Ozawa's emasculated carrier fleet which was reported to be coming down from the north. Actually, Ozawa's force was simply a decoy, but the U.S. admiral could not know this, so he went about, searching for enemy carriers, but is said to have failed to advise Admiral Kinkaid that he was taking all of Task Force 38 with him.

Despite his losses to the U.S. submarines, Admiral Kurita continued on what proved to be a suicide mission. He still had the battleship *Yamato*, three other battleships, eight cruisers and ten destroyers. Off the Leyte beachhead, nothing opposed him but six light carriers, three destroyers, and four destroyer escorts. The Japanese admiral opened fire from fourteen miles, but Rear Admiral Clifton A. F. Sprague began launching planes like wasps from a disturbed nest, and what followed produced an episode of gallantry rarely matched in naval history.

When it was all over, the Navy aircraft from these three small carriers had sunk three heavy cruisers, but the destroyer *Johnston* was sent to the bottom after she had braved the deadly fire of the

opposition to put a torpedo into a heavy cruiser. Admiral Kurita's heavy caliber guns also sank the destroyer *Hoel*, the destroyer-escort *Roberts*, and the escort carrier *Gambier Bay*, but nevertheless, Kurita decided to break off the action when within only five miles of the other carriers, and just beyond the troop transports at Leyte. When he had the greatest chance of scoring the most devastating attack of the war, he turned around and escaped through the San Bernardino Strait.

Meanwhile, far to the north, Admiral Halsey who was searching out a decoy force, had no trouble in sinking four fangless carriers, one light cruiser, two destroyers, and damaging two battleships, two light cruisers and four destroyers.

Who should have covered San Bernardino Strait will always be a controversial feature of the battle for Leyte Gulf. Both Admiral Halsey and Admiral Kinkaid believed the other should have been in a position to stop Admiral Kurita from escaping. But again, there was glory enough for all, and in particular for the U. S. Naval airmen who so splendidly upheld the Great Tradition.

After the Philippine Sea battle of June 1944, a new and almost incredible weapon of war was used—the kamikaze self-destruction attack airplane. The fantastic idea of self-sacrifice as a weapon against American warships was first put into effect—according to a Japanese version—on October 15. This was just prior to our Leyte landings. Vice-Admiral Nashaharu Arima supposedly flew his plane into an aircraft carrier, but there is no record of an American carrier being hit between October 14–18. However, there are several Japanese versions of this kamikaze incident.

The kamikaze was probably the most effective air weapon, next to the Zero fighter, that was developed by the Japanese in World War II. Much of its value lay in the propaganda that supported and nourished it. To the American mind, it was macabre and bizarre, regardless of its military value as a weapon. The idea that men would deliberately destroy themselves in the service of their country caused Commander John Thatch to philosophize, "Every time one country gets something, another soon adopts it. One gets a new type of engine or plane, and the opposition picks it up. One country develops radar, and soon everyone has it. But the Japs have got these kamikaze boys,

and no one else will get that, because nobody else is built that way."

The propaganda value of this man-guided weapon can be understood when it is recalled how Radio Tokyo used to publish the names and histories of their kamikaze "hero gods," who, after making the great sacrifice, were always promoted two or three ranks, as compared to the single-rank promotion of the men who were killed in the heat of battle. There were also radio programs in which little boys chattered on about their ambitions to become kamikaze pilots.

At the end of the war it was learned how effective the kamikaze had been in the hands of a desperate people. In ten months of action these suicide planes accounted for 48.1 per cent of all U.S. warships damaged, and 23.3 per cent of the ships sunk during the Pacific engagements. Of 650 suicide attacks, 174 hits or damaging misses were scored. At Okinawa 279 ships were hit in 1900 attempts.

At first the kamikaze threat was ridiculed and some fanciful figures were released concerning its impotence, but these views were not entertained by U. S. Navy personnel, and in some areas it was reported that near-panic resulted. Admiral Chester W. Nimitz made a very complete and grave report to President Roosevelt. But it was withheld from public release until April 13, 1945, and the full impact of the report was not appreciated since President Roosevelt had died the day before.

In most instances kamikaze aircraft were stripped-down Zeros and loaded with a 550-pound bomb. This plane was selected chiefly because it had the maneuverability to break through the defending cordon of Navy fighters. A few other types were used at intervals, but the bulk of the kamikaze attack program was placed aboard the gadfly Zero.

Although the Japs insist that their suicide attacks began on October 15, these deliberate crashes were first noted at the height of the battle for Leyte Gulf when puzzled antiaircraft gunners shot down several planes that were diving toward the light carriers *Petrof Bay* and *Sangamon*. The *Suwannee*, a 1942 oiler that had been converted to an escort carrier, was hit and there were many casualties on board.

Other planes began making what were obviously suicide dives on more CVEs (light carriers) that were supporting the Leyte landing, and the *Kalinin Bay* was badly hit and three other vessels received minor damage from near misses. In the midst of this shipboard con-

fusion, a kamikaze struck and went straight through the flight deck of the *Saint Lo* (formerly the *Midway*), causing heavy explosions and fires that sent her to the bottom.

The *Intrepid*, one of the thirteen ships of the new *Essex* (CV fast carrier) type, took a direct hit from the new kamikaze attack, but the damage was slight and the casualties few. The next day, the *Franklin*, another *Essex* class carrier, was hit for the first time and had to return to the United States with a 40-foot hole in her flight deck. Two days later the "green hornets," as the sailors were calling them, sank a destroyer and damaged three others.

On November 5 the famed *Lexington*, a converted battle cruiser and sister ship to the first *Saratoga* carrier, was sunk when a suicide bomber crashed into the signal bridge and caused 182 casualties. The *Intrepid* was hit again on November 25, as were the *Hancock* and *Cabot*, the last two seriously. The *Essex* received some superficial damage, and on these four carriers sixty men were killed and sixty-nine wounded. The unprecedented bravery of the little men took a savage toll.

From October 24 until November 29, forty ships were hit by the dedicated men of the "divine wind." Of this total sixteen were valuable carriers.

But the kamikaze attacks did not end with the battle for Leyte Gulf; they were continued into 1945 with improved equipment and strategic ideas and showed that the Japanese also had a great, if self-immolating, tradition.

We cannot close out the year 1944 without paying tribute to the airmen of the Royal Canadian Air Force. Their Number 6 Group of Bomber Command played a particularly impressive role in the program of devastation that conquered Germany. This heavy bomber organization, under the command of Vice Marshal C. M. McEwen, had the lowest number of casualties and the highest in sorties and destructiveness of any in the Canadian service.

All through October 1944 when bomber warfare was at its peak, 6th Group, who considered themselves the cream of the crop, scorned casual attire, kept the stiffener wire in their caps and always appeared ready for dress parade. "Black Mike" McEwen who had fought with the old Royal Flying Corps in World War I, was a colorful, hard-

hitting airman, but a soldier from his heels to the top of his head. While his men were off on a raid, McEwen never slept a wink, and he frequently accompanied them, despite the superstition that the presence of gold braid puts a jinx on an aircraft. "Black Mike" flew dozens of sorties until Air Chief Marshal Sir Arthur Harris put an end to it.

After V-E Day, Sir Arthur wrote: "I regard this officer's contribution to the efficiency and effect of the bomber offensive as invaluable. In ability, as in personality, he stood out among his fellows. He is a great commander and the value of his work was a major contribution toward the success that was achieved. I cannot speak too highly of him, or of his share, and his Group's share in the common effort."

The 6th Group won a Victoria Cross on June 12, 1944, when a Lancaster bomber of Number 419 Squadron, flown by Flying Officer A. deBreyne, left Middleton St. George on a flight to Cambrai. The trip out to the target was uneventful but as it came in low to make its bomb-run over the marshaling yards and repair shops, the Lancaster was severely hit by an enemy night fighter which had attacked from below and astern. Both port engines were shot out of commission and fire broke out between the mid-upper and rear gun turrets. Another blaze blossomed from the port wing and when all reasonable efforts to quench the fires had failed, DeBreyne gave the order to abandon ship.

Pilot Officer Andrew C. Mynarski left the mid-upper turret and moved toward the escape hatch. As he did so he heard the rear gunner call and saw that his crew mate had been imprisoned by the failure of the hydraulic gear, and that the manual lever had broken off in his hand. Mynarski stayed behind to attempt to free his chum, but to no avail. Eventually, the rear gunner signaled him to save his own life. After one last effort and with his clothing aflame, Mynarski moved to the hatch, turned and solemnly saluted before jumping.

French civilians watched his descent with his clothes and parachute in flames and when he hit the ground they ran to assist him, but the gallant Canadian was so severely burned he died shortly after. By some miracle, although imprisoned in the flaming and pilotless Lancaster, the rear gunner escaped after the crash and wound up in a prisoner-of-war camp. On his release he testified to Mynarski's at-

tempts to save his life when he could have left the burning aircraft earlier and escaped death.

The story of the gunner who survived and that of the French peasants who saw him descend in flames, resulted in 6th Group's Victoria Cross, bestowed posthumously on Mynarski for a "most conspicuous act of heroism which called for valor of the highest order."

Another example of the Great Tradition.

The Royal Canadian Air Force's first Victoria Cross of World War II was awarded posthumously to Flight Lieutenant David Ernest Hornell of Mimico, Ontario. Mynarski's V.C. was not awarded until after the war when his captured crewmates were released and told his story.

Hornell's award was gained on antisubmarine operations in the North Atlantic shortly after the invasion of Normandy. At the time he was captain and first pilot of a PBY amphibian aircraft that had been on patrol out of Iceland for several hours when a fully surfaced U-boat was sighted traveling at high speed on the port beam.

Flight Lieutenant Hornell turned to attack and the U-boat immediately altered its course. The aircraft had been seen and there could be no surprise; instead the enemy gunners opened up with a particularly vicious antiaircraft fire.

The front guns of the amphibian fired at the submarine from some 1200 yards until one weapon jammed. Hits were noted on and around the sub's conning tower, but the aircraft was badly damaged in the starboard wing.

Although the plane was difficult to control, Hornell maneuvered for a depth-charge attack. Oil was pouring from the starboard engine and fire broke out; obviously the fuel tanks could explode at any minute. Nevertheless, Hornell continued to stalk for position, and risking everything, moved in and dropped his depth charges from a low altitude in a perfect straddle. The bow of the U-boat was lifted clear of the water.

Hornell then tried to regain a little altitude but the fire in the wing had grown intense and a serious vibration had set up. As the crew of the aircraft watched the submarine sink and the enemy sailors flounder in the sea, the burning engine fell from their plane. There was nothing to do but attempt some sort of a landing, and with

superhuman effort the young Canadian finally put down the floundering PBY on a rising swell. It was a perfect landing, under the conditions, but by the time it had settled on the ocean, the amphibian was burning furiously.

There was only one serviceable dinghy but it was not large enough to hold all the crew, so they took turns in the water holding on to its sides. The waves were eighteen feet high and at one time the dinghy capsized and was only righted with great difficulty. Two of the crew died from exposure during this ordeal.

Meanwhile, aid by air had been sent out to them and an airborne lifeboat was dropped, but it fell some five hundred yards downwind and floated away. Flight Lieutenant Hornell, who was as exhausted as any of the surviving crew members, proposed to swim to it, and was only restrained with great difficulty.

After they had been in the cold waters for twenty-one hours, the survivors were finally rescued, but by this time Hornell was blinded by the salt water, and he died from exposure shortly after being picked up.

This young Canadian had completed sixty operational missions, involving six hundred hours of flying, and he knew well the danger and difficulties attending attacks on submarines. By pressing home a skillful and successful attack against fierce opposition, with his aircraft in a precarious condition, and by fortifying and encouraging his comrades in the subsequent ordeal, he displayed valor and devotion to duty of the highest order.

[1945]

HITLER'S DESPERATE EFFORT to break up the Allied ground advance during the Christmas week of 1944 ended in bloody failure. General von Rundstedt's near-success at Bastogne had left both sides exhausted; the Nazis forces were backed up to the Rhine and hard-pressed by the Russians in Poland and Czechoslovakia. In the face of this, the German Air Force made one final spurt to stop the Anglo-American air attacks that were hacking the German Army to ribbons. This master stroke, known as Operation Hermann, was set up by Luftwaffe Feldmarschall Hugo Sperrle, but seems to have been played down by most British and American war historians.

On New Year's Eve 1944, the pilots of ten elite Jagdegeschwaders were denied all holiday festivity—there was no drinking, and after being served a substantial supper, the airmen were sent to bed early. At 5 A.M. the next morning they were roused out and given a final briefing, with tubby Goering on hand to do some back-slapping. At 7:45 A.M. they took off from about twenty snow-covered air strips. This force, that consisted chiefly of Focke-Wulfs 190s and Me 109s, totaled about 1110 of specially equipped raiders—any fighter that could carry light bombs was included in the mission. This strike in which Sperrle risked his all, had no precedent in the European campaign. Whether the holiday letdown had anything to do with the Allied failure to head it off, is not clear.

At 8:05 A.M. an artillery-spotting Taylorcraft reported: "Have just spotted formation of at least two hundred Messerschmitts flying low on a course of 360°."

Twenty-five minutes later twenty-seven undefended Allied airfields, strung between Eindhoven and Brussels, were hit by a scourge of low-flying fighter bombers. The German pilots were grouped into three massed elements of between three hundred and four hundred planes each, and were led by three Junkers 188s whose crews were responsible for the pinpoint navigation necessary to find the targets.

The first pack nosed down over the Zuider Zee and hedgehopped all the way to Brussels. A second appeared over Arnhem and roared toward Eindhoven. The third, destined for American fields, came out of the mists over Venlo.

This three-pronged raid was as much of a surprise as the Jap attack on Pearl Harbor. For thirty minutes the Luftwaffe fighters wiped up everything in the area. Only a few isolated Spitfires and Tempests managed to get airborne during the raid.

At the Evere field near Brussels, 123 aircraft, including cargo, Flying Fortresses, Typhoons, and Spitfires, were destroyed. At Eindhoven Number 124 (Canadian) Typhoon wing and a Polish Spitfire wing were almost wiped out. When the beatup was over nearly three hundred Allied aircraft had been put out of action. The few Tempests and Spitfires that scrambled into the sky claimed to have shot down thirty-six raiders. British and American antiaircraft fire was later credited with downing fifty-seven more.

Field Marshal Sperrle's desperate operation was well designed and boldly carried out. Allied officialdom decided to withhold the story, since it came close to the Bastogne "victory." Later, some American press services presented it as an unimportant raid that had been frustrated, with a loss of one hundred German fighter bombers, but, actually, it paralyzed the Allied tactical air forces for well over ten days. Fortunately, British Air Marshal Harry Broadhurst had, within twenty-four hours, reorganized a few fighter squadrons to hold the situation in check.

Activity in the war against Japan was intensified by the development of the Boeing B-29 heavy bomber. The history of the famous Superfortress reflects the amazing progress in America's military aircraft. It was designed two years before Pearl Harbor—too late for a part in the war in Europe—and only by forcing the production schedule at every turn was it possible to make it available for the

conflict in the Pacific. Strategic bombardment in occupied Europe and Germany had shown what could be done, but the timetable against Hirohito threatened to be much slower, for there were tremendous distances to cover, and much ground and water to be regained.

The heroic assault against Guadalcanal was, in turn, an indication of the grief ahead and a half-promise of eventual success, but no one had any idea how many months it would take. At the time, the B-29 was still having trouble with its engines and certain equipment, but it was the only U.S. hope in this critical situation.

Building and perfecting a heavy bomber to strict specifications and material availability was only one facet of the problem. Training pilots, flight engineers, navigators, bombardiers, radio operators, and gunners to the same strict specifications was another. The size of the B-29, alone, was a major consideration, and time was another hurdle. The biggest bomber had to be produced in the least time with a minimum of second-guessing and design.

One of the engineering feats accomplished was the development of the Pratt & Whitney R3350 W-57. More than two thousand major and minor engineering changes were necessary to bring this engine to combat perfection. Because of its size, the airframe of the B-29 created many other problems. Pressurization of the cabin was necessary, and was one of the chief matters of concern. Although airtight cabins were not new, the problems presented in a bomber of this size were tremendous. Nevertheless, when these giants flew off for Japan they were efficiently pressurized.

The Boeing bomber was designed to fly high, far and fast, which ruled out any immediate possibility of adequate fighter escort on most missions, so it was developed as a self-sufficient airplane, able to defend itself under all conditions. This disproved a previously held theory that no bomber could be built to fly an efficient mission and defend itself against enemy fighters.

From this necessity grew the "little black box" central-fire-control system that removed much of the guesswork in air gunnery and racked up an unusually high rate of scores for the B-29 gunners. The armament was unique in that it included five remote-controlled turrets, and one of these, the tail turret, carried a 20-mm cannon in addition to the twin .50-caliber machine guns. The remote-control

feature enabled the turrets to be made smaller, which imposed less drag on the aircraft, and the turrets could be installed in positions where their fire power would be most effective while the gunners remained at fixed stations where they, the intricate sighting devices, and computing gunfire systems were better protected.

A measure of the effectiveness of this fire-control system in keeping Japanese Zeros at their distance, is shown in the first six months of combat operation when only fifteen B-29s were lost to enemy fighter action in the air. In contrast, 102 Japanese planes were destroyed, 87 were probables, and 156 were severely damaged in air combat.

Starting with a nucleus of battlewise veterans, the 58th Bombardment Wing, consisting of four groups of thirty aircraft each, was organized at Marietta, Georgia, in June 1943. Six months later, as part of the newly organized 20th Bomber Command, it continued its training at selected airfields in Kansas.

At the beginning of 1944, American Army Air Force engineers started work on suitable combat fields in India and China. With 700,000 native laborers and little modern equipment they prepared five fields in India and four in China within the space of a few weeks. In April 1944, 20,000 men of the service and tactical units arrived, and on June 5, just two days less than a year later, the Army B-29 was flown in combat for the first time when the 58th Wing went on its initial bombing mission to Bangkok, Thailand. On June 15, as part of the new Twentieth Air Force, it brought the attack directly to the Japanese homeland when Yawata was bombed.

In mid-August the Superforts flew the longest-range bombing operations in aerial warfare; a joint operation that covered the widest range between targets ever bombed simultaneously by a single organization. The targets were Nagasaki and Palembang, the former in the Japanese homeland on the southern island of Kyushu, and the latter at the outermost limit of the Japanese Empire on the island of Sumatra. More than 3000 miles separated the targets. At Nagasaki the B-29s struck at one of the vital links in Japan's weakening chain of shipping. Palembang provided critical oil supplies for the Japanese sea and air services.

In November of 1944, just after the 20th Bomber Command, headed by Major General Curtis E. LeMay, had completed its seventeenth mission, Brigadier General Haywood S. Hansell's 21st

Bomber Command, which flew out of Saipan, joined forces with LeMay's Superforts and set the pattern for 1945. By January 9, of that year, Tokyo targets had been attacked six times.

The building of the new Twentieth Air Force posed many new problems, but everything about the project was new. The aircraft was new, its tactical employment was new, and even the basic idea of a global air fleet was new, for the B-29 was expected to participate in joint operations or to be assigned to strike wherever the need was the greatest.

A global air force must have adequate bases, a continuous flow of parts and supplies and a system of rapid-fire maintenance. Superfort installations on the island of Saipan were an excellent example of how this was accomplished. The first Air Force Service Command units landed on Japanese-held Saipan on June 30, 1944. The workers were under constant sniping, heavy artillery attacks and strafing by enemy aircraft. For a time the guns of those service units were the only antiaircraft defense on the field, and their half-tracks had to patrol continually to prevent enemy infiltration. Thirty days later Isley Field on Saipan was handling one of the largest volumes of Army, Navy, and Marine air traffic in the entire Central Pacific area.

A new maintenance service had to be organized to support, supply and maintain the Superforts in their raids on Japan, but even with such efficient service facilities, combat forces sometimes got ahead of these units, so mobile aircraft repair shops, manned by experienced airplane mechanics, propeller specialists, sheet metal workers and other skilled craftsmen, were moved to any area where they were needed.

Except for the greater distances involved, the B-29 was used strategically against Japan in much the same way in which the B-17s and B-24s were employed against Germany. The problem of destroying Japan's industrial power was not a simple one. Japan was not a group of moderately small islands covered with inflammable paper houses, as many people believed. Through the war years this island enemy had built up a tremendous supply of resources. Her inner empire, plus Korea and Manchuria, covered more than 730,000 square miles and constituted a highly developed, almost self-sufficient industrial and agricultural unit that was three times the size of Germany.

The B-29 attacks seemed to be made of a series of "firsts" and "mosts." They flew the longest daylight raid, hauled the largest bomb load ever carried, over the widest field of operation. By December 31, 1944, the Twentieth Air Force had completed thirty-nine so-called strikes, some were large, some small, but were carried out on an almost daily basis. Although this new air offensive was still in its early phases, the citizens of Tokyo already had an inkling of the cost and destructiveness of modern war with the dawn of the new year. Before 1945 was half over the Japanese Empire would be impressed with its full meaning.

There was ace activity in the Pacific too. Major Richard Ira Bong provided his share with forty victories over his Japanese opponents. Major Thomas B. McGuire, Jr., who shot down thirty-eight enemy planes, jostled Bong for the theater leadership and between them gave the Pacific a thrilling competition—while it lasted.

Bong first comes into the picture on July 7, 1942, when he was on the carpet before Lieutenant General George C. Kenney, commander of the Fourth Air Force. It seems that Second Lieutenant Bong, a fair-haired, pink-cheeked adolescent, had been looping the central span of the Golden Gate Bridge in San Francisco Bay. There was also a departmental matter of low-flying through the streets of the city, and one irate housewife had written in to complain that some crazy airman had actually blown all her washing off her line.

Needless to state, General Kenney scoured Second Lieutenant Bong, and ordered him to report to the woman's house, assist her with the next stack of laundry and make doubly certain that none of it fell into the backyard.

As Bong was leaving his office, Kenney inquired, "How was the aileron control when you were down that low, zipping past tenements?"

"Perfect, sir. I had no trouble at all," explained Bong with no change of expression.

The next time these two men met was during September 1942 when Bong was flying P-38s out of Laloki in New Guinea. He had just returned from a fight over Dobodura where twelve Lightnings had taken on twenty-five Japanese fighters and bombers. When the fight was over, the P-38s had shot down fifteen Japanese aircraft, two of

which were credited to Bong. Kenney flew from Brisbane to Laloki to congratulate the squadron, and he then asked to see Bong's combat report. In it Bong had mentioned only the time of take-off, the time of arrival over Dobodura, the shooting down of two aircraft, the time of his landing. Nothing more.

"Watch that boy," General Kenney warned his colleague, Lieutenant General Ennis C. Whitehead. "If I'm not mistaken, he will be the American ace of this war."

By January 1944, Richard Bong had scored nineteen times. He was now one of the "Big Three" of the Southwest Pacific, in company with Colonel Neel E. Kearby who had nineteen victories, and Lieutenant Colonel Thomas J. Lynch with sixteen.

Another pilot, who had bailed out and been rescued from the sea during the bombing of Rabaul, had a score of eleven, eight less than Bong. He was a small, black-mustached captain named Tommy McGuire.

Richard Bong was given an unusual mission in February 1944 when his Group commander explained, "Intelligence has discovered that a Japanese aircraft will arrive this evening at 6 P.M.-at Wewak with a V.I.P. aboard. You will take off with Colonel Lynch and try to intercept this aircraft."

Wewak was 450 miles away, but by fast flying and good navigation Lynch and Bong arrived over the field precisely at 5:58 P.M. The Japanese transport plane had just landed and was taxiing along the runway. Lynch was the first to attack, but he had forgotten to set his gun sight. "Your turn, Bong," he grumbled over his radio.

Bong dived and fired a single burst; the spread of bullets blew up the airplane's gas tank and she exploded. No one had time to get out and a few officers who were walking out to greet the visitors were bowled over by the concussion.

When Bong and Lynch returned Kenney called them into his office. "Okay, what happened? We have a good idea, because we monitored an exchange of radio messages from Wewak to Tokyo."

Lynch told the full story and Bong simply nodded.

"If that aircraft was on the ground when it blew up, you can't include it in your in-air score, you know," Kenney explained.

"I am aware of that, sir."

"But it might have bounced, and could have been a few inches above the ground. In that case. . . ."

With a dead pan Bong answered. "No sir. It was on the ground. It had actually stopped."

Late in April 1944, Bong had shot down his twenty-seventh enemy plane and passed the World War I record of Captain Eddie Rickenbacker. General Kenney decided that that was enough, and he called Bong in and said, "I'm going to promote you to major and send you back home for a rest. Anything particular you'd like to do?"

"Yes, sir. I should like to take a refresher at Gunnery School."

Contrary to the usual run of high-scoring aces, Bong was not a good shot in the air. His scores were made because he could outfly his opponents and then drench them with buckets of bullets at almost point-blank range.

Kenney agreed and, while Bong was Stateside, Army Air Force officials confirmed another plane he had shot down; his score rose to twenty-eight. When he returned to the Southwest Pacific, General Kenney had another idea.

"This is what you are going to do," the theater chief explained. "You will make a tour of our fighter bases and pass on to the pilots any new instruction you picked up back home. If you can teach about one hundred of them to shoot down one Japanese aircraft, you will be doing a more important job than fighting yourself. From now on you are an instructor."

Bong didn't like it, but he accepted the situation.

The next day, General Kenney received a visit from the then Captain Tommy McGuire.

"Look, General," Tommy began with little formality. "I want to get back to flying. The doctor says I can't. All right, I've had an attack of malaria, but I'm okay now."

"You looked pretty washed out to me."

McGuire pleaded with him. "Listen, General, when I came out here early in 1943 that guy Bong had eight victories. I tried to catch up to him, but every time I nailed two, Bong covered me, so I was always eight or so behind."

"This isn't a crap game, McGuire!"

"When he was sent back to the States, he stood at twenty-eight and I had twenty. I figured here was my chance, but I fell sick. I

only got out of the hospital yesterday, and I'm grounded for ten days. I'm still eight behind and God only knows how many Japs Bong will clobber in that time."

"Back to the sack and quit worrying." Kenney grinned. "I've just made Bong an instructor."

On October 10, while accompanying a small formation of U.S. fighters during the bombing of Balikpapan and with orders to observe the results of his gunnery instruction, Major Bong "found himself in a position of self-defense," and shot down two Jap planes. General Kenney reported this to General Arnold in a telegram, and added, "Although it is regrettable, this brings Bong's official score to thirty, but I have requested that he be more prudent."

When McGuire heard of this, he went into a "I want to fly" tirade again, and was immediately given permission. On his next mission Tommy downed two Japanese, but was still eight behind instructor Bong.

As soon as a captured Japanese airfield at Tacloban on the island of Leyte was opened up for U.S. flying, General Kenney ordered a force of P-38s to fly in and take over. When the Lightnings landed, Kenney and General Douglas MacArthur were having lunch. The last pilot to climb down was Major Richard Bong, and MacArthur greeted him warmly and shook his hand.

"Who told you to come here?" Kenney demanded.

"I obtained permission from General Wurtsmith and General Whitehead," Bong replied quietly.

"They tell you, you could fly combat missions?"

"No sir, but I'd like to."

MacArthur laughed and Kenney shrugged his shoulders in resignation.

"Go ahead. We can use anyone who can get a P-38 into the air."

At 5 p.m. five Japanese aircraft were sighted and Bong took off with five "pupils" to intercept them. During the fight that ensued, the instructor shot down one, just to provide a good example. On the following day, October 28, Bong went on a survey mission to look for sites that were suitable for more airfields. On this routine duty he met two Japanese aircraft, and destroyed them with two short bursts. Obviously, his gunnery had improved.

Two days later McGuire landed at Tacloban. In the course of the

trip his squadron of P-38s encountered a Jap patrol of six planes, and Tommy got one of them. The following day he destroyed two more and the score stood: Bong, 33; McGuire, 25. Tommy was still trailing by eight.

Now there was more interest in the Bong-McGuire competition than in Stateside reports of the Big Ten football conference. Bong never talked about it, but, like all challengers, McGuire ranted day and night. The scores were posted in every squadron HQ in the Southwest Pacific, and whether the opposition was mediocre or whether Bong and McGuire were inspired, their respective victories mounted day by day; 34 to 26, 36 to 28, 38 to 30.

On December 12, 1944, a semicircle of P-38s were lined up on the Tacloban airfield. There was a guard of honor of twelve pilots, each of whom had a dozen victories to his credit. A very self-conscious young major stood before them.

Richard Bong was to receive the Congressional Medal of Honor from General Douglas MacArthur.

When it was all over, Bong disappeared; he had forgotten to have lunch before the ceremony, and lunch was more important than the adulation of the high rank of all services, and of the war correspondents.

Two days later General Kenney learned that Bong and McGuire, although members of different squadrons, were by some mysterious razzle-dazzle sharing the same quarters. The general found both of them taking a shower. McGuire tried to explain. "Here's how it is, sir. The pilots in Bong's outfit think he is a jinx to them. As soon as they meet a formation of Japs, Bong shoots them down. There's nothing left for them."

"I still don't get it," General Kenney argued.

"It's simple. Bong came over here this morning and asked if he could fly with me . . . with my squadron. I was just leaving on a reconnaissance over a Jap airfield and I suggested that he accompany me. We each took off with a 'winger.'"

Kenney put up with that for three days, or until Bong had scored his fortieth victory; McGuire was still eight less. Kenney again ordered the leader home, and directed him to give a few fighting lectures to the pilots until the leave and transport papers came through.

McGuire now had the field to himself. On Christmas Day while escorting bombers over Mabalacat he added two more to his score, and four more during an enemy raid on Clark Field, for which feat he was awarded the Congressional Medal of Honor. At last, "Eight Behind" McGuire had thirty-eight, only two behind Richard Bong who was about to board a transport for the United States.

Now General Kenney was worrying about McGuire.

"You don't look well, lad. Unless you take care of yourself, you'll be down with malaria again. I'm going to ground you for a few days."

McGuire almost went through the top of the Operations shack. "But, I need only two to be even with Bong."

"I know all that, but you will be grounded until we hear that Major Bong has arrived in the United States."

"How soon will that be?"

"Just as soon as Transport finds a place for him."

Bong arrived home on January 6, 1945, and Kenney called McGuire before him. "Bong has been given the hero treatment and he has handled it like a gentleman."

"He deserves everything he got," McGuire said approvingly.

"You have behaved very well, too, Tommy. You're free to fly again, but don't force your luck. Beating Bong's score isn't important. Take it easy and fight as though you hadn't a single victory to your credit."

"Yes, sir," Mac agreed. "You're perfectly right. Besides, I have two newcomers. Now I'm being the instructor."

On January 7, McGuire and Major Rittmayer took the two replacement pilots out for a practice sweep over a Japanese airfield. They met a solitary Jap Zero fighter at about two thousand feet over the island of Negros.

"You follow me," McGuire snapped to his student "winger."

Mac dived on the Jap but the enemy banked sharply and came out on the tail of Rittmayer's P-38. Seeing this opportunity the Zero pilot began to machine-gun him.

Rittmayer called for help. "Hey, McGuire. Give me a hand."

McGuire heard the call and banked sharply in response. His wings came away and the P-38 disintegrated in mid-air and spun into the ground before Mac could get out. While the two tyro pilots looked

on the Jap poured another spread into Major Rittmayer's P-38, and it burst into flames and crashed. The "wingers" could do nothing, but return to their base and make their grim reports: Major Thomas B. McGuire, Jr.—killed in action, January 19, 1945.

The great race was over. The figures are still to be found in the official records.

Major Richard I. Bong	40
Major Thomas B. McGuire	38

Major Bong, whom General Kenney had ordered out of the combat zone, and whom everyone believed to be out of danger in the States, was killed in the explosion of an Army jet-propelled P-80 during a test flight at Burbank, California, in August 1945. Besides the Congressional Medal of Honor, Bong was awarded the D.S.C., the Silver Star, the D.F.C. and the Air Medal.

Tommy McGuire, a native of New Jersey, was honored further when McGuire Air Force Base at Fort Dix in his home state was named in his memory.

Although it was not generally known at the time, the U.S. forces had a secret weapon in hand, but for some reason it was not fully applied against the enemy. This was the proximity fuse, a most sensitive, shell-detonating device that eliminated the necessity of direct hits on any air target. With such ammunition a gunner could fire into a formation of enemy fighters, and if his shells sprayed in the general area of the aircraft, they burst the instant they reached a certain proximity to the targets. It would have been a major weapon, had it been fully employed in the air war over Europe.

Some details of this device were outlined to the author by Major General Orvil A. Anderson (Ret.) who held a responsible post with the U. S. Army Air Forces in Britain during the war. He is now Executive Director of the Air Force Historical Foundation at Maxwell Air Force Base, Alabama. General Anderson pointed out that had this fuse been used when it was available, the war might have been brought to an earlier close, and many lives saved.

"The proximity fuse, which had not been developed by our adversaries," he explained, "could have been tailored to fit any explosive missile. The 37-mm cannon was the only suitable weapon we had in

production as aircraft armament, but this gun was prohibitively large for our four-engined bombers, but with the proximity fuse it would have been far superior to the .50-caliber machine guns we were using. Either a 20-mm or 30-mm gun would have been superior to the 37. But to have had them in time, required deeper foresight than we possessed.

"Let me stress that the introduction of this weapon would have to have been soundly timed. If it were prematurely committed and samples of the fuse were captured by the Germans, the results could have been disastrous. If they had employed a proximity fuse in their antiaircraft fire against the massive bomber formations we flew in 1944 and 1945, our losses might have been more than we could have withstood for any length of time. This hazard is, of course, always present when a new weapon is assigned to combat forces.

"My proposal at the time, which I still think sound, was to produce a 30-mm air cannon with proximity fuse ammunition, and at the beginning of the all-out air offensive, to install these weapons in the rear turrets of all four-engined bombers. If we had followed this proposal at the beginning of 1944, we would have greatly expanded the defensive fire power of our bombers with low probability that the Germans would have discovered the secret in time to produce and employ the fuse effectively before we gained a decision in the air war. That hazard was present and dictated our decision never to put the proximity fuse in any combat aircraft.

"Secret weapons pay optimum returns when they are geared to strategic purpose and exploit the opportunity that offers best returns. In a dynamic technology, secret weapons retain that feature for only a limited time, and they serve their purpose only if they are employed while that superiority lasts. Intelligence reports disclosed that Germany was working on a proximity fuse, but—to our good fortune—wasn't doing too well.

"Our proximity fuse, fired from guns on bases in England worked miracles against the buzz bomb, but we didn't move any batteries to the Continent until we were confident the enemy was on his last legs. But once, he shocked us. He broke through at Ardennes and overran the batteries and ammunition dumps, but his breakthrough came too late in the war. We were never fired on by proximity fuses."

An interesting postwar reaction has been reported recently concerning the combined British-American raid on the old city of Dresden in early February 1945. At the express request of the Soviet Army the R.A.F. drenched the city, once known as the Florence of the Elbe, for fifty-six minutes with high explosive and fire bombs. By this time Dresden was the main center of communications for the defense of Germany on the southern half of the Eastern Front. The city had never been bombed before, but as a large center of war industry, it was also of high military importance.

Eight hundred British aircraft hit the city on the night of February 13, bombing in two sections to break up the night-fighter defense, and give the second section a chance to complete the saturation attack. The U.S. day bombers hit Dresden again in attacks over the next two days. When it was all over some 32,000 people were dead, and 1600 acres devastated.

Today, in Dresden, British and American visitors are shown an enlarged photograph of the wartime city, which indicates the full effect of the raids, the resultant fires, and general devastation. Unquestionably, a lot of damage was done during this combined U.S.-British attack when compared to the 600-acre loss in London, 400 in Plymouth, and about 100 acres in Coventry.

On a placard below this present-day photograph is a statement to the effect that it shows the result of **TERROR BOMBING BY THE AMERICANS AND BRITISH** and concludes with **A TERRIBLE ACCUSATION AGAINST THOSE GUILTY OF THIS MASS MURDER.**

Dresden is located in the Soviet-controlled portion of East Germany. The placard is meant to be an indictment of the capitalist system. The blame for the destruction of Dresden, the Communist guide would have the visitor believe, reflects the imperialism that brought Hitler to power. The blame was America's and Britain's. Nowhere is it ever mentioned that Nazism brought on the war, or that Dresden was bombed at the request of the advancing Red Army officials who feared that Hitler was assembling his shattered armies there.

In the last year of the war, 1945, the jet-powered airplane was introduced to military aviation. Again, it was the Germans who first produced this new power unit and the aircraft designed to use it. If

the jet plane had been employed to its fullest capacity, the over-all result might have been far different.

There was nothing original about jet propulsion. Indeed, on looking back, one wonders why the Second World War did not open with sizzling battles between jet or turbojet powered aircraft. The jet engine was not new, no more than the rocket missile was new. An Italian prop-jet-powered Caproni-Campini C.C.2 experimental aircraft was flown as early as 1932, but was discarded as uneconomical. Shortly after, a young Royal Air Force cadet, Frank Whittle, was so intrigued with the idea of jet propulsion that he wrote a scholarly thesis on the subject, as a contribution to his final examination at Cranwell, the R.A.F.'s training college. Young Whittle was positive he could build a jet-propulsion engine, and to his astonishment, the technical officials of the service gave him permission to experiment—in his own time, of course.

This resulted in Whittle's eventually developing the plant which was to be adopted by both British and American air services, and which powered our early jet productions.

About 1937 jet propulsion experiments were being carried out in Germany along three distinct lines. 1) Rocket propulsion in which fluid fuel oil is burned continuously and the necessary oxygen for the combustion is contained in one of the fuels carried, and as such is independent of altitude. 2) Turbojet engines which work on the same fundamental principle, but the oxygen is taken from the surrounding air and is conducted into the engine via a turbine. Its aviation ceiling is determined by the oxygen content of the atmosphere it passes through. Rocket propulsion uses about seventeen times as much fuel as the turbojet engine. 3) Jet propulsion, which differs from the turbojet principle only insofar as it receives the oxygen by the natural pressure of air created when flying, instead of by a turbine, and therefore is dependent not only on altitude but also on the speed achieved.

Although little was generally known of this revolutionary idea, experiments with various types of rocket and jet-propulsion engines were under way in several key areas. A British Whittle jet engine was sent to the United States for study "and improvement" and eventually a jet-powered fighter was produced by the Bell Company. Willy Messerschmitt and Dr. Alexander Lippisch produced a rocket-

engined airplane that probably was the first to exceed the speed of 600 mph. It was known for a time as the Me 163 and an experimental squadron was organized. Lippisch's rocket plant provided not only great speed, but many problems of fuel consumption and necessary degrees of safety during its operation. The "power-egg" gobbled up five tons of special fuel in return for a few minutes of actual flying time. At best, this squadron could take to the air, one by one, make short attacks on invading aircraft and then glide back to their base. As such, the Me 163 never fulfilled its mission.

In the meantime the Heinkel 178 had been in the course of development and was probably the first true military type jet aircraft to be flown. This plane made its first flight on August 27, 1939, and exactly one year later a new Italian Caproni-Campini jet took to the air. The British Gloster-Whittle, dubbed "the Squirt" went into the skies on May 15, 1940, and on October 1, 1941, Robert M. Stanley flew the first U.S. jet (with a Whittle engine). All this went on in great secrecy, and only those actively connected with each project knew what strides were being taken in the science of aviation.

It is realized now that by 1944 Germany was at least eighteen months ahead of the Allies in the development of jet-powered military aircraft, but they benefited little by this lead. In the first place the German High Command apparently had no idea what to do with such a weapon. They were confused by the varied demands and requirements of their flying bomb (V-1 and V-2) program and could come to no sound or fixed agreement as to which to support. Next, when their jet engine had proved itself, the German air strategists could not agree whether to build jet fighters or jet bombers. By early 1943 their Me 262 twin-jet prototype was being flown by high-ranking officials, and although all were delighted with its performance, the idea of producing a great fleet of these high-speed machines was months in reaching fruition.

Major General Adolf Galland, who was dismissed later as Commander of the Fighter Arm for his advanced thinking in matters of aerial defense, saw immediately the value of the jet plane, and fought for its development. He believed this weapon to be the answer to the British-American strategic bombing program. "If the enemy adheres to the piston-engined plane," he wrote, "we shall have an unbelievable advantage in all operations." At his suggestion, one

hundred Me 262 jets were ordered, but Hitler, who still believed that a proposed Heinkel 177 heavy bomber would play a large part in ultimate victory, held back the production of the Me 262 until he could decide whether to put the Luftwaffe on bomber-offensive or fighter-defensive operations. This was late 1943. Hitler's vacillation held up the first production order of the jet fighter for more than six months. More than two years had already been wasted in bureaucratic indecision, prolonged test programs and industrial bewilderment.

Then, for no apparent reason, the German High Command decided suddenly to go into full production on the Me 262. At this Goering toadied to Hitler by suggesting that the fully tested jet fighter might be redesigned for fighter-bomber missions. In Berlin, Hitler was confronted with the imminent Anglo-American invasion and though he had high hopes for the V-weapon, he did not believe the Me 262 could wrest air superiority from the Allied forces. Thus, the jet fighter which might have accomplished this and put the torch of disaster to the Normandy invasion, was now to become a fighter bomber, a supplementary weapon for the army in its attempt to stop the Allied ground forces once they swarmed out of the beachheads.

Goering, who had lost much of his Prussian bounce, no longer dared argue with Hitler, and when the Führer demanded to know whether the jet fighter could carry bombs, Hermann tossed away his war-in-the-air by replying obsequiously, "Yes, my Führer. There is enough power in those two engines to carry one thousand pounds, perhaps even two thousand pounds."

Goering was correct from the power point of view, but the Me 262 was not designed for delivering great bomb loads, nor did it carry intricate bombsights. It was not capable of pulling out of speeds of more than 600 mph. At low altitude, on bomber missions, the fuel consumption was so high it was operationally unprofitable. High-altitude bombing was out of the question.

But Goering dare not explain all this to Hitler, although he most certainly should have done so. Instead, he fawned while the Führer beamed and made another of his grim decisions. "I have long demanded a speed bomber that can evade any fighter defense. In this aircraft, I see the 'blitz bomber,' with which we will repel any invasion in its opening phase. Regardless of the enemy's air cover,

this aircraft will strike at recently landed mass of matériel and troops. At last, we have a blitz bomber!"

Few men in authority took much notice to Hitler's brain wave, and Galland quietly formed a commando of experienced fighter pilots with the idea of first trying to bat down a small number of annoying R.A.F. Mosquito daylight reconnaissance planes. These "wooden wonders" were much too fast and maneuverable for anything in Goering's flying stable, but the Me 262 in its fighter format was certainly much speedier. Adolf Galland had high hopes.

The earlier experiments with the rocket-powered Me 163 had alerted the Allies to this jet fighter threat. When the Me 262 began to harass the Mosquitos, General Jimmy Doolittle staged his famed "Big Week," which was directed against the German aircraft industry, and as a result the initial order of one hundred Me 262s could not be delivered. More important, the production facilities were not rebuilt until late in March of 1944, and when the first batch of jet fighters was ready to move out of the sheds, they were hit by a heavy American daylight raid. This left the German jet fighter program exactly where it was one year before.

General Galland went back into his battle for more fighters. The British and American bombing was even more efficient as the days rolled by. Their tight box formations in the daytime, which furnished terrific gunnery defense, had taken a toll of more than one thousand pilots in a period of four months. The British night bombers were equally dangerous, for they were growing bolder, gaining in strength, and outnumbering the night fighters sent up to intercept them. But more important Galland was losing his best flight captains, squadron leaders, and wing commanders, for anyone who could fly was expected to take his place in every defensive formation.

Galland put all his hopes in the production of a few Me 262s to stop the American daylight raids, which were taking an average toll of fifty aircraft and about forty pilots. These could not be replaced under the Luftwaffe's training scheme.

Nothing he could do improved the situation in any way. Hitler refused to think in terms of air defense and when he learned that his "blitz bomber" had been ignored and the Me 262 was still being produced as a fighter aircraft, he had one of his traditional rages.

Field Marshal General Erhard Milch who attempted an explanation, was dismissed from his post.

Hitler issued a new proclamation. Hereafter, the Me 262 was not to be referred to as a fighter, or even a fighter-bomber. It was to be known only as a "blitz bomber." There was no argument. The command of the Führer had to be obeyed. The fighter arm and the defense of Germany in which the jet fighter might have played an important role, had to be abandoned. All the testing, pilot training, and other programs of jet fighter action were taken from the General of the Fighter Arm and given to the General of Combat Fighters (bombers).

As Anglo-American raids were making a shambles of German industry, transportation, synthetic oil plants, and armament storage bases, a vain attempt to make fighter bombers of machines and men went on, but by the time the Allied invasion opened on June 6, 1944, not one blitz bomber was available. Not until a month later did a few go into action against the invasion army, but by now they were too few and too late. Some gallant pilots tried to fly the encumbered Me 262 as a fighter, but it was almost impossible to make such a change and produce the required facilities. As a fighter, the Me 262 was too fast for men trained in bombing tactics; they had developed none of the physical attributes of the single-seater pilot and so were almost useless in such a role.

General Galland suggested a compromise; that a few jet fighters be retained, but his appeal was rebuffed. However, he did manage to collect some 262s and keep his small band of commando pilots available. He was so persistent that the accelerated production line was eventually turning out only fighter versions of the Messerschmitt jet. How this came about is difficult to explain. For one thing the Luftwaffe was in dire trouble. Fuel was in short supply. The V-weapons had been blasted out of their bases, and since there was little or no use for German bombers their production was stopped. Only the Me 262 offered any hope of prolonging the outcome and perhaps winning better or more lenient surrender terms. The original fighter-bomber squadrons that had been equipped with the modified jets, had flown themselves to a standstill and had received no replacements.

At the Lechfeld airfield, Number 51 Luftwaffe Fighter Squadron

was being equipped with fighter-type Me 262s to be piloted by commando airmen. During one American daylight raid six of these jets were sent up to meet them. This was all that was available at the time and they were unable to prevent the U.S. formation from destroying some sixty Me 262s (blitz-bomber types) that were on the ground at Augsburg.

In October 1944, Galland finally received an order from Goering to form a new jet-fighter unit, with the hope that its success would convince Hitler that the Me 262 was an out-and-out fighter plane. At the same time the Arado Ar 234B jet bomber had come off the production line. This aircraft was fitted with two Junkers jet-pods and had a speed of 425 mph and could carry a two-ton bomb load, as well as 800 gallons of fuel. The Ar 234B jet is said to have carried out many valuable missions, "especially as a reconnaissance plane." For each of these Arado bombers made available to the bomber arm, Hitler allowed one Me 262 to go to the fighter forces.

Galland's first true jet-fighter force was led and commanded by Major Walther Nowotny, who was credited with a bag of 250 enemy aircraft. This unit was organized on a field near Osnabrück, and in a few weeks, Nowotny's group had shot down more than fifty Allied aircraft. Their employment was interesting in that it was necessary to have a small force of piston-engined fighters sit above to cover their take-offs and landings. On October 8, 1944, Galland first saw his beloved jets play an important role. On this day a strong American heavy bomber force, escorted by Thunderbolts and Mustangs roared into the area. Nowotny took off with his jets and Galland listened to the progress of the battle over the base radio. Nowotny reported his first kill and then screamed that one of his jet engines had dropped out of the aircraft. He said he would try to get back to his base, but apparently he became involved in a tangle of action and was picked off by some Mustang or Thunderbolt pilot. His Me 262 dove straight into the ground. It was Nowotny's last flight and fight and his loss apparently triggered Hitler's decision in November to permit the formation of a complete jet-fighter wing, a Flying Hitler Youth organization of sixteen- and eighteen-year-old boys who were supposed to pilot the new Heinkel He 162 Volksfighter single-engine jet, without previous training on piston-powered fighters. Fortunately, this frantic gesture never came into being.

General Galland proposed that all idle aircraft plants go into high production on the Me 262, building the twin-engined jet under license, and because he ridiculed the Hitler Youth Volksfighter plan, he was replaced as General of the Fighter Arm.

Meanwhile the Heinkel 162 monstrosity was pushed along, and by December 1944 the first public test flight was made, but unfortunately, the prototype disintegrated in mid-air and the pilot was killed. Nevertheless, Hitler and Goering persisted in this mad scheme and about two hundred He 162s were produced, most of which eventually fell into the hands of the Russians.

The Anglo-American ground and air campaign continued. Berlin received its fortieth mass raid, and night after night the R.A.F. pounded at town after town. During the last week of March 1945, a record of 67,365 tons of bombs were dropped, and by April 6 there were few worthwhile strategic targets left in the whole of Germany. The next day the large-scale raids were halted, and by April 10 American four-engined bombers raided Berlin for the last time. Two weeks later the Eighth Air Force began its transfer to Okinawa in order to bomb Japan in co-operation with the U. S. Twentieth Air Force.

The last real air battle of this war over Germany was fought on March 18, 1945, when Berlin was attacked by 1200 U.S. bombers that were escorted by fourteen P-51 fighter squadrons. In this engagement German Me 262 jets had a field day. These unusual machines ripped through box after box of American bombers and in spite of being outnumbered by one hundred to one, the German jets destroyed twenty-five bombers and five fighter planes. Later that month a new force of Me 262s was stationed in the Munich area with high hopes, but by then the Allies and the Russians were closing in. Every day the fronts were squeezed in tighter from all sides, and Galland's JV 44 jet fighter group had small chance to operate under normal conditions. Their field was under constant observation by American aircraft and frequent raids kept thousands of workers busy repairing one open landing strip.

Conflicting orders from GHQ had Galland and his pilots in a turmoil. New commissions sprang up overnight. The aircraft industry stood helpless under a storm of orders, retractions, production schedules, and new turns of officialdom. In the middle of all this mess,

Goering explained to Galland. "You were right, from the start. We should have used the Me 262 as a first-line fighter from the day we knew it would fly. We have wasted months and months."

Over the last few weeks of the war when Germany's ground forces had quit fighting, Galland's fighter group continued the hopeless battle. He fitted R4M rockets under the wings and added other explosive missiles. These rockets, mounted in racks, were incredible for they could be fired from outside the effective range of the bombers' defensive fire. A complete salvo would hit several bombers simultaneously. Galland's force played havoc with U.S. tactical B-26 Marauders, but they had come too late. The fate of Germany was sealed. The German front in Italy collapsed. The Red flag was waving over Vienna. Russian and American soldiers were shaking hands at Torgau and the last of the 2,755,000 tons of bombs delivered by the Allies fell on the famous old town of Pilsen.

Galland flew his last mission on April 26 when he led a flight of six Me 262s against a formation of Marauders. They were engaged near Neuburg, but it was not much of a battle for the German leader forgot to release the safety catch on his rockets. As in all jet-fighter melees, the fight lasted but a few seconds and there was not time to remedy mistakes. A hissing Mustang slipped in and poured a sharp burst at Galland. He received a slug in one knee, his instrument panel went out, the engine covers were shot away and the starboard engine was damaged. Adolf Galland decided to turn back for his airfield and attempt to get the hulk down. He arrived there as a force of U. S. Thunderbolts was beating up the airstrip, but there was nothing to do but glide in and hope.

His final mission was analogous to the collapse of the German Reich. Although flying the finest fighter on active service, he had failed to use its full potential. He might have downed several American Marauders, but he had forgotten to properly release his rockets, and an American piston-engined fighter, the end product of Anglo-American co-operation and unity, had snatched at its brief opportunity and blasted the head of the German Fighter Arm from the skies and sent him scuttling back to a bomb-blasted airfield.

Great Britain produced the first truly efficient jet-propulsion engine, but made little headway with a jet plane. A few fully equipped

Gloster Meteor fighters were built and put into squadron service, but they had only a small part in the war on the Continent and there is no record of their engaging in any important aerial battles. Some were assigned to ground-strafting sorties that harried the enemy till the end of the war.

Contrary to the general impression these Meteor jets were not used in the air battles against the flying bombs. Only Tempests, Mustangs, and the latest Spitfires—all piston-engined planes—were employed. Squadron Leader Berry, who flew a Tempest during those frantic months, was credited with destroying more than sixty of the pilotless missiles.

Piston-engined aircraft of British Bomber Command enjoyed much success in the closing months of the air war, and through these memorable weeks put in much time and effort cleaning up many of the loose ends, and wiping out many old scores.

It will be recalled that when Guy Gibson's Number 617 Squadron was being formed to make the historic raid on the Ruhr dams, many of his pilots were under the impression that they were to carry out another raid on the German battleship *Tirpitz*. The history of this vessel is worth recording here.

This naval wonder led a charmed life throughout most of the war. In the spring of 1943 she was the leader of a pocket-battleship fleet, which consisted of the *Scharnhorst*, *Lutzow* and one six-inch cruiser and eight destroyers; all of them skulking in Narvik harbor. This fleet had caused Prime Minister Churchill and President Roosevelt to halt the costly supply convoys to Russia. In a note to Stalin, Churchill had explained that "the danger to Russian convoys has been revived in a more menacing form. I do not think it right to risk the Home Fleet in the Barents Sea, where it would come under attack by German shore-based aircraft and U-boats, without proper protection. If one or two of our most modern battleships were lost or seriously damaged while the *Tirpitz* and other large units of the German fleet remained in action, the whole command of the Atlantic would be jeopardized."

This decision did not sit well with Stalin who argued in turn that transporting supplies across the Pacific or up through the southern route could in no way compensate for the discontinuation of the northern route. He closed with, "You realize, of course, that the cir-

circumstances cannot fail to effect the position of the Soviet troops."

This unhappy situation tangled American, British, and Russian war co-operation, and for months and months the British pondered on the problem of destroying this pocket-battleship fleet.

In the autumn of 1944 the *Tirpitz* was lying in Alten Fjord on the north coast of Norway. She was out of range of British Lancasters, carrying a normal bomb load, so Air Marshal Harris ordered Numbers 617 and 9 Bomber Squadrons to fly "light" to a Russian bomber base, refuel and load up with 12,000-pound medium bombs. By attacking from the east it might be possible to hit with complete surprise, or before the usual smoke screen could be spread.

The plan was not completely successful. Although the *Tirpitz* was hit with one 12,000-pound bomb, later photographs showed the explosive fell on the bow in a not too vulnerable section. The Germans evidently made emergency repairs and moved the vessel at very slow speed to Tromsø for further necessary work. This put her within bombing range of the Lancasters based in Britain, but Tromsø was so far north that winter darkness was almost twenty-four hours long, and a daylight attack was practically impossible.

Instead of waiting for spring of 1945, Numbers 617 and 9 Squadrons were sent out again, but complete cloud cover prevented precise bombing. A third raid was flown and this time two hits were made with 12,000-pounders—one bomb struck amidships, tearing a 100-foot gash in the vessel's side and she capsized. The colorful career of the *Tirpitz* was at an end.

Other notable ships of the German fleet were hit successfully by Bomber Command: the *Admiral Scheer* was sunk at her dock with a salvo of 100-pound bombs, the *Admiral Hipper* was caught in dry dock and rendered useless for further naval action, the battleship *Schlesien* was hit and had to be beached, the *Elbe* was burned out and beached, and the pocket battleship, *Lutzow*, was attacked in the canal at Swinemünde and sent to the bottom. The fast cruiser, *Koln* was trapped in Oslo Fjord and badly damaged. She limped back to the dockyards at Wilhelmshaven, where the bombers of the U.S. Eighth Air Force blew her to junk.

While I met many Allied aces and multidecorated heroes of the bomber squadrons, there were some who eluded me. I once spent a

week trailing Colonel James Stewart who was racking up a good record as a bomber pilot. I hoped to go on a raid with him for a personal article of a trip over enemy territory. Other correspondents in Britain had tried to write the same type of story, but so far as I know, none succeeded. In my case, I got as far as the gate to his field, was politely turned down, given lunch, and sent on my way.

Some months before, I had tried much the same idea with Clark Gable, who was serving as a waist gunner with one of our bomber squadrons. Again no luck. I did not meet Major Robert S. Johnson, a very personable young man who flew with the 56th Fighter Group and ended his war with twenty-eight victories. Johnson had been sent back to the U.S. when I went to Halesworth to interview Colonel Gabreski. At one time Johnson was the highest scoring ace in the European Theater, and I regret I have never met him. His personal story, *Thunderbolt*, written in collaboration with Martin Caidin, is fine reading for every young American.

One of the most tragic figures in my notebook is Major George E. Preddy, whom I met a few weeks after the invasion. This quiet, sad-eyed young man had downed twenty-six enemy planes before fate overtook him in a most cruel manner. He had flown twenty-five combat missions in the Pacific before he was twenty-five years old, and after a P-40 he was flying broke up in mid-air, he was given two months' rest, and then sent to Britain to fly Mustangs. George was a natural in the P-51, and soon ran up a record score. At times it looked as though he would make a runaway of the ace race in the ETO. On one occasion over Hamburg he shot down six German defense fighters—all fully confirmed—in six short minutes.

Although it was late August 1944 when I talked with this strange young man who had left the bookbinder's trade to become a war ace, it was not until early in 1945 that I learned of his tragic end. I remembered sitting with him in his dim cubicle talking about his long career. None of it was offered in buoyant enthusiasm, and at times he would halt in the middle of a sentence to ask me about World War I. He concluded that my war seemed to have provided more fun than his, and I had to agree with him.

Before we walked outside to look at his favorite Mustang, he explained that he was about to be relieved and he hoped to go home for a ninety-day furlough.

"Good!" I said. "But don't do anything foolish. Remember 'Gabby' Gabreski. He was going home too, but he had to have one last flip. When you are handed your papers, don't bother to pack your bag. Just go."

Predy nodded and stared into space, but I learned later that he had taken my advice. However, he was back by December and on Christmas Day 1944 he shot down two Messerschmitts and then turned on a Focke-Wulf and was forcing it down close to the ground; at that point of the action, an American antiaircraft battery opened fire on the German, but hit Predy's Mustang instead. There was no room to get out and take to the silk and another American hero crashed to his doom.

The record of Lieutenant Colonel John C. Meyer of the 487th Fighter Squadron, 352nd Fighter Group, was also jotted down in my notebook. I encountered Meyer on a British base before his organization moved over to Belgium. This husky, quiet-spoken gentleman is today credited with thirty-seven enemy aircraft destroyed in the air or on the ground. This sort of compilation confuses readers who attempt to keep track of wartime aces, but this new method of figuring results was established by some aviation writers shortly after the invasion. Meyer had twenty-four victories in the air when the war ended for him. Early in February of 1945 he was injured in an automobile accident and confined to a hospital for many weeks, and when he left was sent home to convalesce.

Late in September of 1944 I returned to the United States by ship and during the voyage was introduced to the vivacious American actress Constance Binney. She had been giving wartime performances for the troops in Britain. Miss Binney would have been a cheerful addition to any group, and she enlivened the life of our small company of civilians.

"Did you meet my husband?" she inquired one evening as we awaited the movie in the lounge. "He's a wing commander in the R.A.F."

"What's his name?" I asked since I knew Miss Binney was using her stage name.

"Leonard Cheshire . . . really Geoffrey L. Cheshire. He has the D.S.O. and two bars, and the D.F.C.," she explained proudly.

"Whew! He must be a killer. The D.S.O. three times! What does he fly?"

"Oh, he's not a fighter pilot. He's on Halifax bombers. Someone in Leonard's mess told me that he is the greatest bomber pilot of any air force in the world. I wish you had met him."

At that moment the public address system began to scrawnc and clear its throat. The nine o'clock news program from London was to be presented. The first item of the broadcast went something like this:

"His Majesty the King has graciously awarded the Victoria Cross to Wing Commander Geoffrey L. Cheshire, D.S.O., D.F.C., for his outstanding service as a bomber pilot. Wing Commander Cheshire has completed more than one hundred successful long-range bombing missions and. . . ."

The rest was lost in Miss Binney's high squeal, and we realized the broadcast item concerned the man we had been talking about. It was a most remarkable coincidence.

"There, I told you," she gurgled, "he's the greatest bomber pilot in the world. That's my husband."

I have still to meet Leonard Cheshire, but I did learn that he once had been a member of Guy Gibson's famed Number 617 Bomber Squadron. This young man had piloted long-distance bomber raids for four years without receiving a scratch. He was flown to New York during one of his short periods of respite, where he met and married Constance Binney.

His was the second V.C. for Number 617 Squadron, and well earned. It was a glorious effort, but on reflection, one wonders whether the shrewd knowledge gained in a global conflict really prepares a man for the eventual buffeting of civilian life; whether a record number of combat missions develops an oversensitive mind that finds no veracity in the normal course of events.

An accepted hero in wartime, Leonard Cheshire, like so many others, appeared to be at a loss in the piping times of peace. Long before the conflict had ended he seethed with idealistic ideas for his future. He wanted to set up an island colony with a group of hand-picked comrades, and establish an airline to fly fresh flowers into the grime of big cities. He also had many far-fetched plans for

experiments in aviation that might eventually take a man to the moon. This was in 1945-46!

Britain's new Prime Minister Clement A. Attlee assigned Cheshire as a British observer to watch America's atomic bomb fall on Nagasaki. This spectacle so affected him that when he returned to Britain, he resigned his commission at the first opportunity and formed a communal band of homeless ex-service men. He worked himself into a physical breakdown in this project and went to Canada to recover. There, this winner of the V.C. is said to have worked for an undertaker, delivered provisions, and cut firewood for his board.

Eventually, he sold his few possessions to pay for his return fare to Britain where he found his ex-service men's organization was a total failure and he was in debt to the amount of \$54,000. He was left alone in an empty house, cold and hungry, but when he heard of an ex-service man who was suffering from cancer, Cheshire took him in, borrowed a bed and nursed him to the end. In the meantime a dozen more indigent sufferers, most of them incurables, crawled to his door. The bills piled up, but everyone was taken care of. Word got around and odd items of help were offered. Student doctors and nurses gave assistance, shopkeepers donated small supplies of food. More bedridden patients found their way to Cheshire's door and the charity settlement spread out and took in two more houses. Money came in by dribs and drabs, but Leonard carried on until tuberculosis tumbled him into one of his own beds.

Still, he carries on; much to the bewilderment of his friends who had seen a career in the R.A.F. as his real reward. Who knows, perhaps Leonard Cheshire, V.C., has found his true goal in life. But what a strange path to such a dedicated purpose.

The final land campaign of the Pacific war was against the island of Okinawa in the Ryukyu group on April 1, 1945. The U.S. invasion forces required more than 1400 surface vessels, including aircraft carriers, to sustain the thrust. The battle was fought for eighty-three days and the final victory caused two Japanese generals, Misuru Ushijima and Isama Cho, to commit suicide. Of the 282,991 U. S. Army, Navy, and Marine personnel involved, 49,151 became casualties. The Japanese suffered 110,071 battle wounds, and more than 7000 were taken prisoner. The U. S. air services lost 763 air-

craft while destroying 7830 of the enemy, of which 1020 were shot up on the ground. Naval operations resulted in the sinking of 36 U.S. vessels, and 369 were badly damaged. The Japs lost sixteen big ships, including the *Yamato*, the world's largest battleship, after she was hit by ten aerial torpedoes. This amazing vessel weighed 72,890 tons, was 861 feet long, and carried nine 18-inch guns. A British task force of twenty-two ships and 244 aircraft also participated in the Okinawa assault.

This historic action, a complete military campaign in itself, is worth a full volume. It required both strategic and tactical aviation planning. The strategic operations were conducted by the U. S. Twentieth Air Force, and the tactical problems were chiefly in the hands of carrier-based aircraft flown by Navy and Marine crews. This tactical air force's primary mission was to establish air bases ashore as soon after the landing as was practical; to provide air-support and air defense. Once the main action got under way there were many other tasks, including aerial photography, first-phase photo interpretation, and control of antiaircraft guns and search-lights.

Since Okinawa was within easy distance of the Japanese mainland, the enemy could throw everything he had, including kamikaze raiders, against the Allied forces. In fact, the glory-divers gave the invaders a very bad time.

The Air Defense Command which discharged much of this duty, was the old Pacific Fighter Command, re-equipped and brought up to date.

According to some historians, the Okinawa landing was the greatest amphibious attack in history. Everything devised for such action was employed, from underwater demolition teams to Japanese suicide boats carrying depth charges. Mighty naval guns hammered the main and satellite islands with heavy explosives. The suicide planes were very accurate; the *Nevada's* number three turret was knocked out and the destroyers, *Porterfield*, *Kimberly*, *Dorsey*, and *O'Brien* were badly damaged before one American soldier made the beach. Then the cruiser *Indianapolis* and six invasion ships were hit. Nevertheless, in spite of a fanatical defense, some 50,000 U.S. troops scrambled ashore and held a beachhead about five thousand yards

deep, and in a few hours enemy airfields at Yontan and Kadena were in American hands.

The next day light grasshopper liaison planes were using these strips and flying off to direct artillery fire. In revenge, the kamikazes hurled themselves at the plodding LSTs as they moved in with troops and heavy military equipment. Their direct hits usually were killers and many men were wounded and all guns and munitions being ferried were lost.

By April 7 the Japs launched a new mass suicide mission involving 355 aircraft, but most of them were shot down by Marine flyers from the carriers *Bennington* and *Bunker Hill*. That afternoon a two-engined Kawasaki fitted out as a kamikaze, headed for the light carriers *Sitkoh Bay* and *Breton* just as a Marine squadron was being catapulted for landings on Yontan, but fortunately five Corsair pilots moved in and began stitching the kamikaze with 20-mm shells, the first time this type of gun had been fired from the F4U-4C. The suicide plane caught fire but the Jap pilot boldly hung to his course until a wing fluttered away and he dropped into the sea a few yards from his target.

And with that, more than eighty Marine aircraft took off and landed on the strip at Yontan. Three more kamikazes were nailed the next day, but various units of the Tactical Air Force had serious losses over the next forty-eight hours. Troop carriers cracked up, bad landing strips wrecked incoming fighters, and in some cases casualties were caused from the storm of U.S. antiaircraft fire that fell like steel hail in the beachhead area.

The ground carnage was shedding much American and Japanese blood in this memorable action, and the flying forces were living a passage of history that has not been fully appreciated, and which was quickly forgotten. Looking back over the records, photographs, logbooks, and histories which have been written, but seldom read, most of it flashes over the pages like the montage of a hundred nightmares. Okinawa was fought for and won but a few short weeks before Germany capitulated in Europe, a climax that erased much of the Pacific reality and the price paid for our island-hopping campaign. By August 14 Japan surrendered, after two doses of atomic fury, and the abrupt finale of this global holocaust wiped out much of the memory of bloody Okinawa.

It is difficult to imagine a modern invasion in which the most dreaded weapon was a man-guided bomb, a missile in which the pilot willingly sacrificed himself to score a direct hit. Yet Okinawa was such a campaign. Our Marines scorched Okinawa with 152,000 gallons of jellied gasoline, a searing formula that had been perfected by the 4th Marine Aircraft Wing. Nothing comparable to this dosage has been used in any other military battle. Neither H. G. Wells nor Jules Verne had fabricated such a weapon. In comparison, the invasion of Normandy was almost a routine military exercise; a plan drawn according to sensible rules, marched over yard by yard, a gigantic military chess game.

Not so Okinawa.

The first kamikaze attack which screeched down from the smoke-wreathed skies from April 6-7 was the worst, but another delivered on April 12 was also severe when the Japs used 125 Navy and sixty Army planes, of which about twenty pierced our air shield and hit our surface craft. Most of the victims were radar picket ships that, of necessity, had to stand out twenty-five to one hundred miles from the embattled island; too far for continued protection by the carrier fighter aircraft. The destroyer *Mannert L. Abele*, commissioned in 1944, went down under a double kamikaze strike, and the LCS 33 was sunk by a Sakura (cherry-blossom) bomb. This was a rocket-driven projectile carried under the fuselage of a twin-engined bomber and launched within sight of the target. Few of these bombs were successful and little was known about them until a few were picked up on the Yontan airfield.

Many of the suicide planes were shot down by fighters from the Fast Carrier Task Force, and Marine pilots from the *Bennington* and *Bunker Hill* again gave their all to knock down fifty-one raiders.

Meanwhile, the Japanese suddenly realized the threat of the U.S. land-based aircraft and turned their wrath on the airstrips at Kadena; their bombers and long-range artillery blasted five Corsairs out of action, a large gasoline dump was ignited, and then 20-mm fire from our own ships burst in all directions, adding to the frenetic activity.

Sixteen Corsairs managed to get airborne amid all the confusion of mud and artillery explosions along the landing strips, and met a gaggle of Jap fighters. One Marine force that had not as yet tasted combat, had little trouble batting down any kamikaze planes that

tried to break through, although the suicide pilots took little evasive action and were swatted like flies.

Ill fortune struck the *Bennington* on April 13 when a pilot taking off for a combat patrol swerved into four F4Us and all five planes caught fire. The .50-caliber ammunition in the wings exploded and sprayed the whole carrier deck; eight aircraft were damaged, five beyond repair, and two lieutenants and a master sergeant were killed. A medical corpsman giving immediate aid was also mortally wounded.

On April 15 a pack of 165 kamikazes came back and the ground troops witnessed an aerial slugging match that must have relieved their own combat tensions. The Divine Wind boys started to sneak through the curtain of antiaircraft fire late in the afternoon. A Marine formation found nine that were seeking their National Heaven, and six of them were promptly shot down. During this foray Lieutenant Frederick F. Zehring destroyed one kamikaze by forcing it into a hillside, but was so intent on finishing his quarry, he piled into the same rise of ground and was killed.

In the Kerama Retto anchorage being used by the U.S. forces, the kamikazes had spread an unbelievable welter of broken and shattered ships. A destroyer minelayer, the *Lindsey*, lay helpless with her bow blown back across her bridge like a battered tin lid. The *Zellers* and *Jeffers* huddled at their berths with twisted and burned decks. The *Zellers*, a destroyer, had a hole the size of a moving van where her wardroom had been, and a burial party on the fantail prepared the latest casualties for their final parade. Two more destroyers, the *Gregory* and *Sterrett*, had their sides caved in and their fuel tanks ruptured. The *Stanly*, also a destroyer, lay with her bow twisted from a Sakura bomb that was called a near-miss. In another lagoon of the anchorage the *Gladiator*, *Manlove*, *W. C. Wann*, *Porterfield*, and *Hudson* showed gigantic rips in their hulls caused by more near-misses of the suicide planes.

April 16 was clear and bright and while the suicide boys blew themselves to atoms on any available target, Jap artillery thumped 105-mm shells into the U.S.-held Yontan and Kadena airfields, killing or wounding many mechanics and administrative personnel. As the 77th Division forced another landing on the offshore island of Ie Shima, carrier-based pilots took on conventional bombers and

kamikaze planes that bombarded the picket ships and destroyers that were supplying antiaircraft fire.

Marine and Navy fliers shared the brunt of this action and the day was a red-letter page in the history of both services. At a point fifteen miles west of Izena Shima, a fighter-director ship put in a call for assistance, and Marine Fighter Squadron 441 sent up a dozen aircraft in response. The pilots found twenty-five Mitsubishi bombers, Aichi bombers and a few Mitsubishi fighters (known as Betties, Vals, and Zekes) at various altitudes from deck level to some six thousand feet.

The Marines went in and took over. Seventeen Jap planes were shot down, four of them by Lieutenant William W. Eldridge. Captain Floyd Fitzpatrick and Lieutenant Selva E. McGinty nailed three apiece. The destroyer *Laffey*, which huddled below, had already been hit by five kamikazes, a sixth then knocked off its yardarms, and a Marine pilot in hot pursuit, shot off one of its radar antennas.

In the evening night-fighter squadrons claimed their first scores in this wild affair. Wild is the word. Lieutenants Arthur J. Arceneaux and William W. Campbell each splashed an enemy west of Point Bolo. Captain James A. Etheridge spotted a plane that was moving in to bomb the Kadena field, so he cut it off, shot it down and then was shot down himself by his own antiaircraft fire. Etheridge's night fighter had to be junked.

The field day ended with the land-based Marine fliers being credited with thirty-eight enemy aircraft, while the carrier-based pilots knocked down ten more. All told, counting the scores of the U. S. Navy and the antiaircraft guns, 270 Japanese planes were destroyed. But with all this opposition, the kamikaze planes continued to score. The destroyer *Pringle* was sunk and the *Intrepid*, an aircraft carrier, was severely hit, and eleven other vessels damaged. Up to this point the devotees of the Divine Wind were credited with sinking fourteen U.S. ships, while many more were damaged seriously. All this despite the fact that General Curtis LeMay had been ordered to put the tactical services of the Twentieth Air Force to the task of blasting out the kamikaze nests on the Kyushu airfields. During the last two weeks of April, LeMay's XXI Bomber Command B-29s flew more than ninety tactical missions and claimed nearly five hundred Japanese aircraft.

In truth, the worst of the kamikaze attacks were over, but there were many bad days ahead in Okinawa.

A brief respite followed during which time sporadic bomber attacks were staged at night against the Yontan field, but on April 22, American aviators stirred things up again by mopping up any kamikaze formations that appeared over the picket ships. In one half-hour melee no less than fifty-four were belted down, thirty-three of them by Marine pilots. Major Jefferson D. Dorrah, a Marine fighter pilot, set fire to five and made a sixth explode, all this within twenty minutes. In a wild quarter-of-an-hour Major George C. Axtell, Jr., shot down five, and a very youthful Lieutenant Jeremiah J. O'Keefe disposed of five and only just evaded a burning kamikaze that tried to ram him on its way down.

On the night of April 27-28 another kamikaze attack of 115 planes roared in. The Divine Winds were escorted by a force of conventional aircraft. A formation of U. S. Navy fighters piled into the lot, which resulted in a long-drawn-out conflict that lasted for more than eleven hours. The Navy claimed seventy-four enemy aircraft destroyed, and thirty more were downed by the ack-ack guns of the surface ships.

Probably realizing that the loss of Okinawa to the Americans meant the last main steppingstone to Tokyo, the Japanese tried again the next day in broad daylight. This skirmish lasted until darkness fell, and this time the U.S. fighters, working out of Yontan and Kadena, were credited with thirty-three victories.

It is difficult for the Occidental mind to justify the continued kamikaze attack, or appreciate its end result, but as a weapon it cannot be ignored. During ten major suicidal strikes in the Okinawa campaign, and many others of a specialized nature, 1650 sorties (individual attacks) were made, and in addition 250 suicide flights were sent out from Formosa, which brings the number to 1900. Of these 14 per cent were effective, as compared with the 26 per cent of hits scored in the Philippines. Whether the Divine Wind volunteers of the initial suicide attacks were more dedicated to their task or whether American fighter pilots and antiaircraft gunners were more experienced by April 1945 may be debated, but the fact remains that during the Okinawa battle, 279 U.S. surface vessels suffered direct hits. Whether a comparable success would have been

made by conventional bombing or torpedo attacks, provides much food for thought.

As in so many other instances of new or secret weapons, the failure to use suitable follow-up measures, or to employ reserve forces to hold the gains, made the wholesale sacrifices a tragic waste.

By the first week of May, Germany's complete collapse was evident, but Japan's new premier Baron Kantaro Suzuki, who had succeeded Premier Kuniako Koiso during the opening of the Okinawa landing, decided to continue the unequal conflict, ignoring the fact that Britain and the United States could immediately transfer the bulk of their European forces to the Pacific, and that Russia had decided her neutrality agreement with Japan no longer had any significance.

Suzuki strutted, postured, and proclaimed, but secretly he was seeking an easy way out, and history states that Emperor Hirohito had instructed him to do so, but the fanatical Army leaders insisted on the continuation of the carnage. Although the Americans now had a firm foothold on Okinawa and the B-29s were reducing Japanese cities to ashes, Lieutenant General Isama Cho, Army Chief of Staff, planned an all-out counteroffensive against the Americans on Okinawa.

A new hell broke loose on May 4 when General Cho used tanks, 13,000 rounds of artillery shells, suicide boats, and amphibious landings intended to cut off the beachheads. The U.S. soldiers and Marines tore the counteroffensive to ribbons, killing more than 4000 jungle troops, after one unimportant breakthrough had been made. Although General Cho's ground forces were contained, the kamikazes were more successful. Most of them flew out of Kyushu, the southern island of the Japanese mainland, just after sundown. Five of them crashed headlong into the destroyer *Aaron Ward*, causing nearly one hundred casualties. Three more smacked into the destroyer *Little* and she sank where she lay. Five other ships were badly damaged, although thirty-six Divine Wind planes were destroyed in the insane engagement.

In another fanatical raid four U.S. ships were sunk, and fourteen damaged, including the cruiser *Birmingham* and the escort carrier *Sangamon*. Navy crews suffered 682 casualties, but this time the Okinawa-based planes shot down more than sixty Jap planes, mainly because they were willing to risk their own ack-ack fire.

At the time Lieutenant Robert R. Klingman, a twenty-eight-year-

old Marine pilot, was flying as wingman to Captain Kenneth L. Reusser. They were at 10,000 feet over Ie Shima when they spotted a Japanese two-seater photography plane dragging contrails in the vicinity of 25,000 feet, and in order to reach that altitude they fired most of their ammunition to lighten ship. The Jap reconnaissance plane then nosed up and they could not get within shooting range until they were at 38,000 feet.

Reusser blasted off the rest of his ammunition but only succeeded in damaging the photo plane's wing. Klingman then went in, only to find that his guns had frozen and he could not fire a round. He would not be denied, however; he tore at the enemy ship and cut away its tail with his propeller and did not withdraw until his blades were batting at the rear gunner's cockpit. He pulled out, and then went at the right stabilizer. Still not satisfied, he took a crack at what was left of the tail assembly, and with that the Jap went into a long spin.

Although he had little propeller left, Klingman made a dead-stick (engine off) landing at Kadena. His engine and fuselage were full of holes from the Jap gunner's weapons, but he himself was unscathed.

Two days later, when his hydraulic line fouled, Klingman decided to bail out into the sea, rather than risk a crash landing on one wheel. A destroyer-escort vessel picked him up, dried him out and deposited him on board Vice-Admiral Richmond K. Turner's flagship where he had dinner with the admiral before being returned to Kadena.

On May 11, Lieutenant General Simon Bolivar Buckner, Jr., Commanding General of the Tenth Army, planned an assault all along the line to help reduce some of the attacks on Admiral Turner's picket ships. The Japs also decided to make another big suicide attack on the same day. This was the one that finished the aircraft carrier *Bunker Hill*. About 150 kamikaze divers came in in small groups of ten planes, dropping "window" to confuse the radar defenses. The Marine pilots from Yontan and Kadena shot down nineteen suicide aircraft as they hurled themselves at the destroyers *Evans* and *Hadley*. Each of these brave little vessels were hit four times, but their anti-aircraft gunners claimed to have disposed of thirty-eight attacking planes.

The Japs then staged a new variation of self-martyrdom on the night of May 24-25 when they made an attack known as a *giretsu*.

It was another form of kamikaze philosophy, but created unforgettable ground confusion. As darkness fell a quartet of Mitsubishi two-engined bombers actually tried to land on the Yontan field, but were shot down immediately into the nearby areas. The anti-aircraft gunners could hear the occupants screaming as the burning ships floundered across the field, but the Japs made no attempt to leap out. A fifth Mitsubishi came in with its wheels up and belly-landed on the main runway about two hundred feet from the control tower. Then about ten Japanese leaped out, machine-gunned the area and set demolition charges where they would do the most harm.

It was some minutes before the American ground forces realized what was taking place and by the time they took defensive measures, three Corsair fighters, two Navy Privateers of the Fleet Air Wing, and four large transport planes were going up in flames; twenty-nine other aircraft were damaged, and 70,000 gallons of gasoline erupted in mad fury. Confusion reigned in the theatrical glare and darkness as wild rifle and machine-gun fire slashed back and forth from one side to the other. The tower operator, Lieutenant Maynard C. Kelley, was killed, eighteen other men were wounded; two of whom lost a leg. Several Japs hid in a damaged Curtiss Commando and hurled hand grenades in all directions.

After they had used all their demolition equipment, the Japanese scattered. They were not rounded up and wiped out (they would not surrender) until midday of May 25. Some of the sixty-nine men who had been in the five *giretsu* bombers committed suicide. A quintet of Japanese aircraft had destroyed nine American airplanes, and seriously damaged nine more, which was probably considered a fair deal by the authorities in Tokyo.

The embattled island of Okinawa was finally secured late in June when Army Air Force bombers were crowding into Okinawa's available airfields. The units included the 494th Heavy Bomber Group, the 319th Light Bomber Group, and Headquarters of the Seventh Air Force Bomber Command. These new arrivals assumed much of the responsibility of trying to bomb Japan out of the war before any American landings were attempted on the Japanese mainland.

The Japs expected these American operations early in October and their planned defense measures included sending 350 kamikaze planes *every hour* against the invasion ships. If the enemy had been

able to maintain its Okinawa rate of destruction, he would have sunk at least ninety of our vessels in any Kyushu landing, and damaged about nine hundred.

But a new weapon was ready to be introduced, and this time it was in the hands of the American forces. We had missed the magnetic mine, the snorkel submarine, the various land mines, 88-mm-gun tanks, aerial mines, jet-powered fighter planes, V-1 and V-2 missiles, but we had the atomic bomb.

The exploit of the B-29, *Enola Gay*, flown by Colonel Paul W. Tibbets, Jr., on August 6, 1945, expresses best the contention that the bomber was the chief air weapon of World War II. The flight and strike also explain the difficulty in presenting the story of the individual in that war when it is compared to the simplicity of line and detail in the air actions of the First World War. What can be said about a fantastic aircraft which was flown by an air crew that had been trained to perform a feat they knew nothing about and with a weapon that only a few scientists could comprehend? Yet, the atomic strike against Hiroshima, and a second one that blasted Nagasaki, ended the Pacific war with a one-two punch that still defies the imagination.

Aircraft in 1914-18 were elementary machines that any man could understand. They were powered with modified automobile engines and, relatively speaking, their design was simplicity itself. Armament consisted of a few machine guns, mounted so they could be loaded from the pilot's seat. Ammunition was exactly the same as that most of the airmen had previously fired from infantrymen's rifles. Bombs were simple missiles released by pulling a flexible-cabled toggle.

There was an affinity between the pilot and his plane that was not enjoyed in World War II. In most cases, the flying man of 1914-18 could always see his mount from his cubicle window, and he could saunter over to it in a few steps. He was in close contact with his machine and the two men who provided its maintenance. In many instances the pilot worked on the engine or guns himself in much the same spirit with which he repaired his motor car or his Parker shotgun.

His missions and combats were staged only a dozen or so miles away, and if he had a forced landing inside his own lines, his mechanic could run out with a motorcycle and sidecar and remedy the damage.

Under such circumstances the mechanics enjoyed a vicarious experience of the action, a sensation denied the ground crews of 1939-45. There was time for all the simple tasks to be carried out. There was time for observations and friendly talk, and in that way the backgrounds, foibles, and idiosyncrasies of the flying men were truly revealed.

In contrast very little was known of the air heroes of the later campaign. We were told where they came from, their rank, the number of enemy planes they had destroyed, or the successful bombing missions they had lived through. Looking back, I for one, realize how difficult it was to really know them as individuals. Most of what was learned was provided in colorless, unimaginative poop sheets that were written and distributed by temporary public relations men. One had to live with, fly with, and more important, enjoy recreation periods with World War II airmen to really know the person being headlined that week.

How then can one present the story of the men who dropped the atomic bombs on Hiroshima and Nagasaki? True, they were hand-picked crews, trained to carry out a certain mission, but although much was written about them, little of it has withstood the test of time to live in the memory. By reviving the factual data of the missions, however, the reader may be brought up to date.

The atomic bomb was first suggested to President Roosevelt by Dr. Albert Einstein on August 2, 1939. The subsequent development, so far as the average person can understand nuclear physics, is generally known. Through Major General Leslie R. Groves' direction, General Arnold set up plans to modify the B-29 Superfortress to carry such a weapon. Later, the bomb had to be tailored to fit the aircraft. The first weapon delivered weighed 10,000 pounds and struck with the effect of 20,000 tons of TNT. It was detonated to explode at 2000 feet above the target, and was released from an altitude of 31,600 feet.

Many Americans have been puzzled that Hiroshima and Nagasaki were selected as the first atomic bomb targets, as they were relatively unimportant cities and contributed little to the Japanese war effort. It was explained years later that they were chosen on the premise that the target city, for the best psychological and experimental purposes, should be one that had been comparatively untouched. General LeMay's B-29s had been battering at Tokyo, Nagoya, Osaka, and Kobe.

Kyoto was the largest undamaged city, and Hiroshima the next. Kyoto was stricken from the list because of its significance to the Japanese people as a national shrine of religion and culture. Ironically, Nagasaki was the first headquarters city of Christianity in Japan! However, neither Hiroshima nor Nagasaki had any prisoner-of-war camps nearby, which may have influenced the U.S. decisions.

Nagasaki had been added to the first list by LeMay's staff, although it was not considered an ideal target topographically, but at any rate, Hiroshima, Nagato, Kokura, and Nagasaki were put under intensive study by Intelligence officers in Washington and the Marianas. In the meantime, U.S. officials who were not sold on the "professor's dream," as the weapon was being called, were still planning to end the war in Japan by air and sea alone. They also pointed out that Russia had been "persuaded" to enter the war in the Pacific. Actually, Stalin had originally agreed to join the Allies against Japan within three months after the war in Europe had ended.

Acting Secretary of State Joseph C. Grew believed that in the face of the B-29s' heavy air assault, the Japanese government could be persuaded to surrender, with a declaration that our war aims did not envision the destruction of the Japanese nation, or the Emperor's office. This opinion was shared by Secretary of War Henry L. Stimson and Secretary of the Navy James V. Forrestal.

The first atomic bomb exploded in New Mexico on July 16, proved to be most successful, and with this, President Truman gave an order to General Carl A. Spaatz to bomb Hiroshima and Nagasaki by July 25.

President Truman wrote later, "I asked Secretary Stimson which cities in Japan were devoted exclusively to war production. He promptly named Hiroshima and Nagasaki, among others."

How Mr. Stimson came to that conclusion is a mystery, for neither was indicated on the XXI Bomber Command's operations map which showed Japan's principal industrial cities, marked for LeMay's B-29 incendiary attacks. Any encyclopedia will disclose that Hiroshima produced mainly raw silk, textiles, and some unimportant rubber goods. Nagasaki was an agricultural prefecture producing some raw silk, porcelain, and it had a small fishing industry. Some distance away there was a naval dockyard, but it was small compared to that at Kobe.

Yet these two unimportant cities were the targets selected for the

first atomic bomb attacks. Had they failed . . . one wonders. At the time we had only two atomic bombs. In both cities more than one hundred thousand people were killed by the infernal blasts. At Hiroshima 75 per cent of the city was razed, and more than one third of Nagasaki was totally destroyed.

The famed *Enola Gay* took off from an airstrip at Tinian at 2:45 in the morning of August 6, and winged over 1600 miles of water to seek out the quiet city of Hiroshima. At 9:15 the bomb was dropped . . . and the whole world gasped!

President Truman then asked the Japanese government to accept the Potsdam-Conference surrender terms. Still defiant in the face of defeat, the Japanese declared the terms were unacceptable.

On the morning of August 9, Major Charles W. Sweeney, piloting another B-29 named *Bock's Car*, took off for a second atomic target. His first choice, Kokura, the seat of a vast army arsenal, was blanked out by the weather. Nagato, which had also been considered for the second strike, was found to be too far away, so, after considerable search, Nagasaki was eventually found and atomized.

Five days later, on August 14, 1945, Japan surrendered, and once more, after six long years of international strife, the world stood blinking at the golden glory of peace, wondering what to do with this strange state of affairs.

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